PACKAGE engineering

The foreman — a key man in packaging

An executive whose company gives its packaging foremen broad authority and major responsibility for day-to-day operations reviews the foreman's job and shows how he fits into the company structure. (See page 17)

What to do about short-run difficulties

A contract packager looks at the problems involved in short-run packaging and offers specific suggestions to eliminate trouble and reduce time lost in starting and producing short runs. (See page 22)

Some mathematics of permeability

Step-by-step development and testing of a new theory to explain moisture vapor transmission through flexible packaging materials — complete with equations and calculations. (See page 28)

Complete table of contents on Page 2

FEBRUARY 1957

VOLUME 2 • NUMBER 2

SCANDIA

Manufacturers of Better Packaging Machinery

• 500 BELLEVILLE TURNPIKE • NORTH ARLINGTON, N. J. •

For more information circle No. 201 on Reader Service Card

Parade of packages—*beautifully protected* *with* Laminated PLIOFILM!

EVERY single one of the famous packages pictured above utilizes laminated PLIOFILM for better product protection.

They are representative examples of the wide range of materials to which PLIOFILM readily laminates—to itself, other films, paper and foil or combinations thereof.

AND FOR RELIABILITY? JUST CHECK THIS LIST OF PLIOFILM ADVANTAGES:

• moisture-resistant • greaseproof • no pinholes • dimensionally stable • excellent transparency • optimum gas transfusion • heat-seals to a positive weld over a wide range of temperatures • easily handled on high-speed automatic packaging equipment

FOR DETAILS, contact your Goodyear Packaging Engineer, or write: Goodyear, Packaging Films Dept. B-6432, Akron 16, Ohio.

GOOD THINGS ARE BETTER IN Pliofilm **GOODYEAR**

PACKAGING FILM

Pliofilm, a rubber hydrochloride—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

1

For more information circle No. 202 on Reader Service Card

For your calendar

February 16-19. National Canners Association 50th anniversary convention, Conrad Hilton Hotel, Chicago. Contact: R. B. Heiney, assistant to secretary, National Canners Association, 1133 20th Street, N.W., Washington 6, D. C. *Telephone: Executive 3-7030.*

February 16-19. Canning Machinery & Supplies Association 50th anniversary exhibit, Conrad Hilton Hotel, Chicago. Contact: W. D. Lewis, secretary, Canning Machinery & Supplies Association, 4630 Montgomery Avenue, Washington 14, D. C. *Telephone: Oliver 6-6979.*

April 8-11. American Management Association national packaging conference, Palmer House, Chicago. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

April 8-11. American Management Association national packaging exposition, International Amphitheatre, Chicago. Contact: John A. Warren, American Management Association, 1515 Broadway, New York 36, New York. *Telephone: Judson 6-8100.*

April 23-25. Research and Development Associates, Food and Container Institute annual meeting, Richmond, Virginia. Contact: Rohland A. Isker, secretary, Research and Development Associates, Food and Container Institute, 1819 West Pershing Road, Chicago 9, Illinois. *Telephone: Lafayette 3-5500, extension 4262.*

May 12-16. Institute of Food Technologists annual meeting, William Penn Hotel, Pittsburgh. Contact: Charles S. Lawrence, executive secretary, Institute of Food Technologists, 176 West Adams Street, Chicago 3, Illinois. *Telephone: Andover 3-6268.*

October 28-30. Packaging Institute, 19th annual forum, Hotel Statler, New York Contact: Charles A. Feld, executive director, Packaging Institute, 342 Madison Avenue, New York 17, New York. *Telephone: Murray Hill 7-8875.*

October 28-31. Society of Industrial Packaging and Materials Handling Engineers, 12th national industrial packaging and handling exposition and SIPMHE short course, Atlantic City Auditorium, Atlantic City, New Jersey. Contact: C. J. Carney Jr., managing director, Society of Industrial Packaging and Materials Handling Engineers, 111 West Jackson Blvd., Chicago 4, Illinois. *Telephone: Harrison 7-6123.*

FEBRUARY 1957 • VOLUME 2 • NUMBER 2

PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

Contents

13 **Technique of product cooling key feature of packaging line**
How to integrate a cooling system into a packaging line when it is necessary to receive the product between 125 and 130 degrees F and drop its temperature to 108 degrees F for filling — as done at Plough, Inc.

17 **The foreman's place in the packaging operation,** by David Baskin, superintendent of material control, tractor group, Allis-Chalmers Manufacturing Company
Making the most of a simplified structural organization for packaging requires capitalizing to the fullest extent on the talents of a foreman and giving him broad authority to effectuate the packaging operation.

22 **Problems of short run packaging line operations,** by George E. Siebel, president, The Cenpro Corporation
An exceedingly down-to-earth discussion of some of the difficulties encountered in launching and carrying out short run packaging, with some practical suggestions concerning what to do about them.

28 **Moisture vapor transfer study results in new theory,** by Barney Hilton, head food technologist, H. W. Lay & Co., Inc.
Experimental work already in progress is proving the correctness of a theory to explain moisture vapor transfer — a theory which has been developed along lines consistent with well-known theories of physical chemistry.

35 **Let's have some machinery for "problem" packaging, by the man in charge of manufacturing and packaging in a pharmaceutical company**
A plea for machinery development and some concrete suggestions concerning it by the packaging expert in a company with many runs of varying length and a lot of change-over.

40 **Announcements of machinery and products**

44 **Industry literature available free**

47 **Classified advertising**

48 **What we think** (our editorial page)

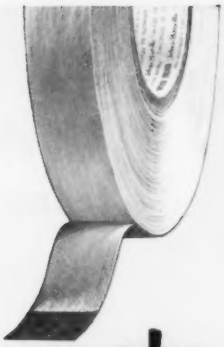
Reader service card inside back cover

Our December 1957 issue will carry a cumulative editorial index for the year listing our feature articles by subject, author, and other headings.

PACKAGING

BUNDLING

PALLETIZING



cuts costs saves work

DUTCH BRAND'S NEW VINYL

strapping tape

REINFORCING

TEAR STRIPPING

TRY THIS FASTER, EASIER WAY TO SPEED JOBS AND SAVE MONEY ON THE LINE... IN THE PLANT

Dutch Brand Strapping Tape is reinforced with glass strands for superior strength. Now, one man can do strapping jobs by hand... and do them fast. Strip, cut, press... that's all there's to it.

Dutch Brand's reinforced vinyl backing, with a pressure-sensitive adhesive, makes this tape strong, wear resistant and pliable as only tape can be. It will not snap, tear, sliver or loosen... even in dampness, heat or cold. It's waterproof, rot-proof, resists chemicals and oils, will not cut into packaging... resists abrasion. Contact your Dutch Brand man today.

Get your copy of our new strapping tape booklet... see how you can save money throughout the plant.

JOHNS-MANVILLE DUTCH BRAND PRODUCTS OF QUALITY

Johns-Manville
DUTCH BRAND
PRODUCTS
7800 WOODLAWN AVE CHICAGO 19, ILLINOIS

For more information circle No. 203 on Reader Service Card

A note from the Publisher

Everywhere one turns one reads of tremendous sums being spent on research and product development, and the resulting shortage of engineers who must translate these ideas into practical realities. The background of every successful product is the same—an idea made practical by good engineering. Aerosol-packaged shaving cream, for instance, started with someone's speculating on how the barbers' method of preparing lather could be made practical for home use. This idea was developed by engineering the proper package to do the job, and a new product was born.

In view of the importance of engineers in today's economy, the report by the National Industrial Conference Board on the unionization of engineers should be required reading for all men concerned with the management of engineers. The survey pointed out that a little over 10% of the nation's half-million engineers belong to unions. The report stressed the fact that engineers do not make up a unionized segment of the economy. However, far-sighted management would do well to look at their own companies and, if there is dissatisfaction within their own engineering staffs, take steps to correct it.

The reasons for joining unions are partly economic and partly the lack of recognition by management.

The fact that engineers are more important today than ever before leads to one of the complaints. Keen competition for the relatively limited number of newly graduated engineers has forced starting salaries up, but salaries for experienced engineers have not kept pace. An engineer today who is 10 years out of school will earn, on the average, twice the starting salary of the man just graduating. Twenty-five years ago the engineer with 10 years' experience would earn on the average of three times the salary of the man just graduating.

In large companies, in which engineers are employed in great numbers, there is sometimes a tendency for them to lose their identity or be considered production workers rather than professional men, which their importance to their companies and their educational background make them. Job promotion through seniority rather than ability is a source of discontent, and frequently leads to job-jumping as the fastest way to advance oneself financially.

The report points out that perhaps this discontent, however trivial it may be today, may be one reason for the persistent shortage of scientific personnel caused by too few engineering graduates each year.

In the engineering field of today, top men do well financially — but this fact does not attract the average young man who must prepare himself for a career that offers the best future, not the best "present."

Packaging is so important today that to many companies the greatest portion of their cost is in their packaging operation. Since many costs are the same for all competitors — hourly labor rates, for instance — engineers will become increasingly important in producing the greatest amount of profit whatever the sales may be.

Angus J. Ray
Publisher

PACKAGE engineering

AN ANGUS J. RAY PUBLICATION

Angus J. Ray
Publisher

R. Bruce Holmgren
Editor

Marilyn Paulson Garbrecht
Assistant Editor

Laurence V. Burton
Consulting Editor

Irwin F. Megargee
Eastern Manager

Anne Bernhard
Business Manager

Burton Cherry
Art Director

Executive and editorial offices:
1791 West Howard Street,
Chicago 26, Illinois
Telephone: Briargate 4-7837

Eastern advertising Sales office:
P. O. Box 270
Ocean City, New Jersey
Telephone: Ocean City 3519

West Coast representative:
The Robert W. Walker Company:
730 South Western Avenue
Los Angeles 5, California
Telephone: Dunkirk 7-4388

57 Post Street,
San Francisco 4, California
Telephone: Sutter 1-5568

Package Engineering is published monthly by Angus J. Ray Publishing Company, Inc., 1791 West Howard Street, Chicago 26, Illinois. Angus J. Ray, president; R. B. Holmgren and I. F. Megargee, vice presidents; James G. Culbertson, secretary and Ethyl K. Ray, treasurer. Please address articles for publication and correspondence regarding the editorial content to the editor. Statements and opinions expressed in articles and editorials are those of the respective authors, for which Package Engineering assumes no responsibility.

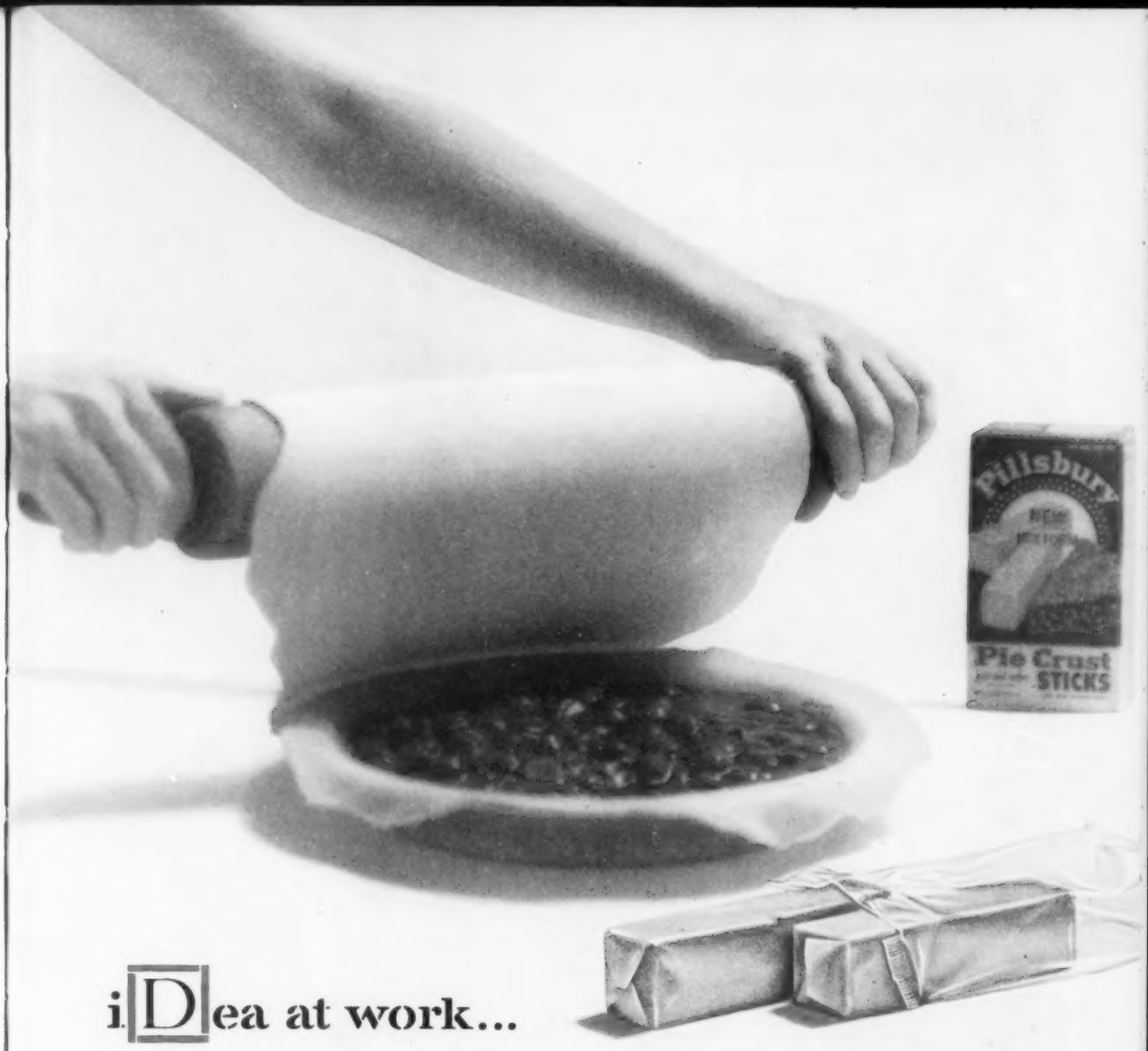
Copyright 1957 by Angus J. Ray Publishing Company, Inc.

Accepted as controlled circulation publication at Aurora, Illinois.

Package Engineering is circulated without charge to engineering, research, development, production and purchasing personnel concerned with packaging in all companies packaging their products for marketing or shipment. Qualified recipients thus are engineering and technical personnel concerned with package research and development, packaging production and package purchasing, within the United States, to all others, the subscription price is $10.00 a year.

Member of Business Publication Audit of Circulations, Inc. BPA

For more information circle No. 204 on Reader Service Card →



i[D]ea at work...

Dobeckmun Durafilm rolls out faster profits for Pillsbury pie crust sticks. Pan-ready freshness is a prime factor in selling a product like pie crust mix. And so is convenience. Clear, strong Durafilm (polyethylene-coated cellophane) by Dobeckmun provides protection and convenience that builds consumer loyalty for your brand. The superior performance of Durafilm on automatic packaging equipment is another important advantage to explore with your Dobeckmun representative.

Dobeckmun Company, Cleveland 1, Ohio • Berkeley 10, California

Albuquerque • Atlanta • Baltimore • Boston • Charlotte • Chicago • Cincinnati • Dallas • Denver • Detroit • Indianapolis • Kansas City
Los Angeles • Memphis • Milwaukee • New Orleans • New York • Omaha • Philadelphia • Phoenix • Pittsburgh • Portland • Richmond
Rochester • Salt Lake City • San Antonio • Seattle • St. Louis • St. Paul • Syracuse • Tampa • Yakima • Havana • London • Amsterdam

Behind today's best sellers . . . .

THE CUSTOM ENGINEERING,

THE DEPENDABILITY,

THE ECONOMY OF

Packomatic

AUTOMATIC PACKAGING

(T. M. Reg. U. S. Pat. Off.)

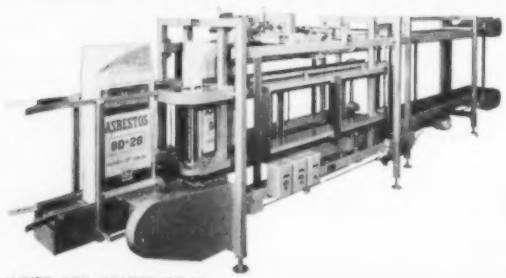
Better packaging means lower production costs and increased volume.

From Quaker Oats Company plants, ten 5-lb. bags of Aunt Jemima flour are shipped to grocers' shelves in paper shipping bales. New Packomatic Bale Sealers automatically fold, glue, position flaps and seal the tough bales securely.

Manufacturers of virtually every bulk or pre-packaged product should consider the safety and economy of the bale for shipping, and the Packomatic Bale Sealer for automatic sealing. Customized to your needs, of course.

But, whatever your package, whatever your budget, there's a particular Packomatic machine for complete automation or for "speed up" of any single operation.

Let a Packomatic representative review your present packaging methods.



WRITE FOR FOLDER 3C-11

PACKOMATIC FULLY AUTOMATIC BALE SEALER

Packomatic Bale Sealers, originally designed to handle, glue and seal paper shipping bales up to 100 lbs. weight, can be customized by our engineers for a combination of weights and sizes within these dimensions:

RANGE: *Length:* 9″ to 18″ in 6″ increments
Width: 5″ to 9½″ in 2″ increments
Height: 14″ to 40″ in 6″ increments

SPEED: The regular Bale Sealer is designed for speeds up to 1000 bales per hour.

CONSTRUCTION: This machine is a heavy-duty machine featuring sturdy, square tubular framework, heavy-duty chains, oversize bearings, heavy-duty reduction units and positive safety stop devices.

Other PACKOMATIC machines include the Bale Sealer — Case Sealers — Opener-Loaders — Case Imprinters — Telescoping Volumetric Filler — Packer-Gluers. Units available, semi-automatic or fully-automatic depending on your needs.

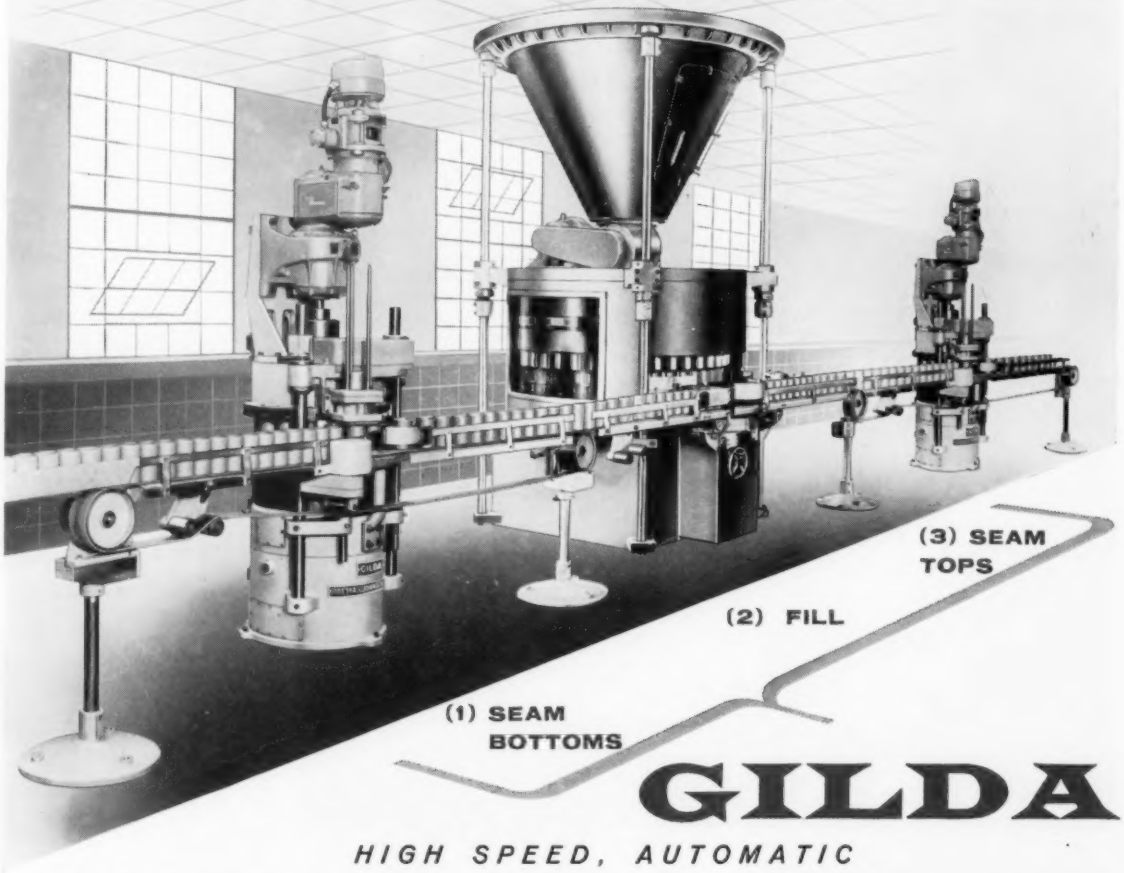
Over 50 years' experience in Customized Packaging Equipment

J. L. FERGUSON COMPANY Joliet, Illinois

New York, Chicago, Cleveland, Boston, Tampa, Baltimore, Portland, Denver, Los Angeles, San Francisco, Seattle, New Orleans, Louisville, Kansas City and all principal Canadian cities.

WINNING COMBINATION

for fast, low-cost, dependable packaging



GILDA

HIGH SPEED, AUTOMATIC

FILLING and SEAMING MACHINES

Give yourself these big advantages--

GREATER SPEED . . . Up to 300 cans per minute. Speed adjustable over a wide range to synchronize with your other machines.

COST-SAVING ACCURACY . . . Filling accurate to a fraction of an ounce, GILDA machines can *save you a ton or more* of material every day!

VIRTUALLY FOOLPROOF . . . Numerous devices protect against damage from faulty cans or covers. Automatically compensate for variations in can heights and cover thicknesses.

FAR LOWER OPERATING, MAINTENANCE COSTS . . . Relatively simple, ruggedly constructed of the finest materials, *fully protected* against dirt and abrasive dusts.

EXTREME VERSATILITY . . . Filler: handles any powder, granular or dry material; fills metal or fiber cans 4¾" to 7" in height. Seamer: puts on tops or bottoms; accommodates any can height from 3" to 8". BOTH MACHINES CHANGE OVER FROM ONE CAN HEIGHT TO ANOTHER IN MINUTES!

END YOUR PACKAGING PROBLEMS . . . Invest in an installation that will insure faster, finer packaging at lower cost than you ever thought possible. Get the facts *now!* Write for descriptive literature or a consultation with a P&J GILDA Packaging Specialist. Potter & Johnston Company, Pawtucket, Rhode Island. (Subsidiary of Pratt & Whitney Co., Inc.)

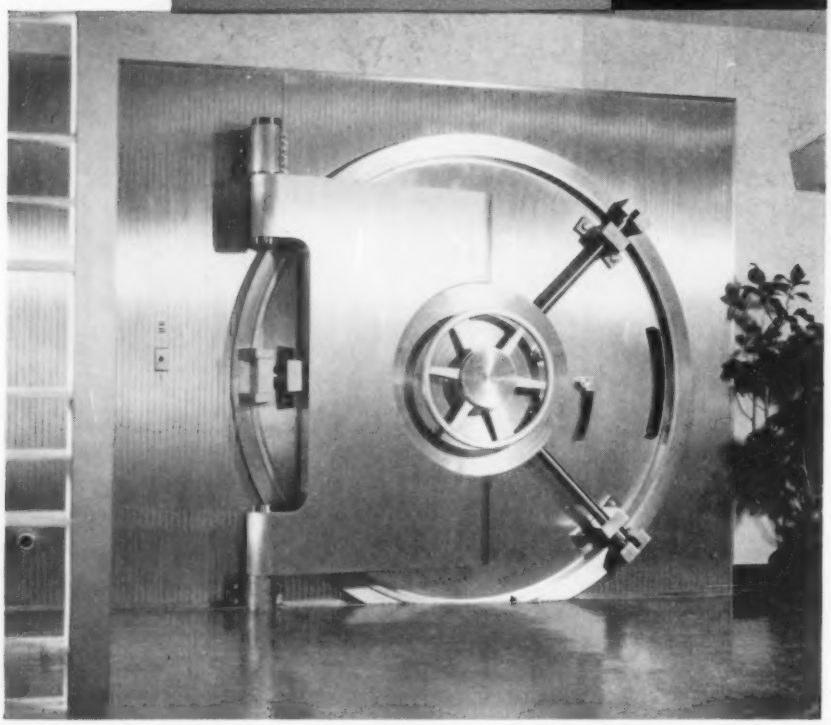
Now manufactured by

POTTER & JOHNSTON

Producers of Precision Machines Since 1898

AUTOMATIC TURRET LATHES • NEWARK GEAR MACHINES • GILDA PACKAGING MACHINES

More Precious than Jewels — Our Promise



Mosler Vault in
Texas National Bank
Houston

GENERAL SALES OFFICE
CROSSETT, ARKANSAS

BALTIMORE OFFICE
J. W. Taylor, Don Hodge
414 St. Paul St.

DALLAS OFFICE
H. E. Manner
3409 Oaklawn Ave.

CHICAGO OFFICE
L. J. Walker, D. W. Schwier
300 West Washington

CINCINNATI OFFICE
R. J. Lantry, J. T. Allen
1816 First National Bank Bldg.

In the new bleach board mill at Crossett we have invested many millions in the finest production equipment anywhere. Yet the price of mere buildings and machines can never approach the value we attach to our reputation for keeping our promise.

What is the promise?

We promise machine time to each customer to produce his established needs in all markets. We know we can *keep* the promise because as an independent mill we are masters of our own destiny. No user of Crossett Board has a higher priority than our smallest regular customer.

Would you like to know more?

CROSSETT PAPER MILLS

A Division of
The Crossett Company
Crossett, Arkansas

WORLD'S TOUGHEST PACKAGING FILM?

IT'S HEAT-SEALABLE! "Scotchpak" Brand Polyester Film takes a seal as tough as the film itself. It's a perfect material for many critical packaging jobs where inertness of the wrapper and protection of the contents under temperature extremes are critical. "Scotchpak" Film resists most solvents and chemicals; has high moisture inertness, high tensile strength, and heat seals easily at 275° to 359° F., 20—60 psi. You can use it for packaging such varied products as cosmetics, acids, syrups, silverware, oils, greases, adhesives, asphaltics, catsup and mustard, surgical dressings, and many others . . . even use it for container liners and insulation pillows. For more information, send for folder described at right.

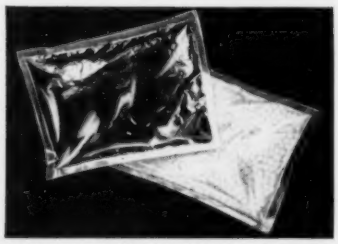
TRADEMARK

"SCOTCHPAK"

BRAND

HEAT-SEALABLE POLYESTER FILM

Look what you can do with it!



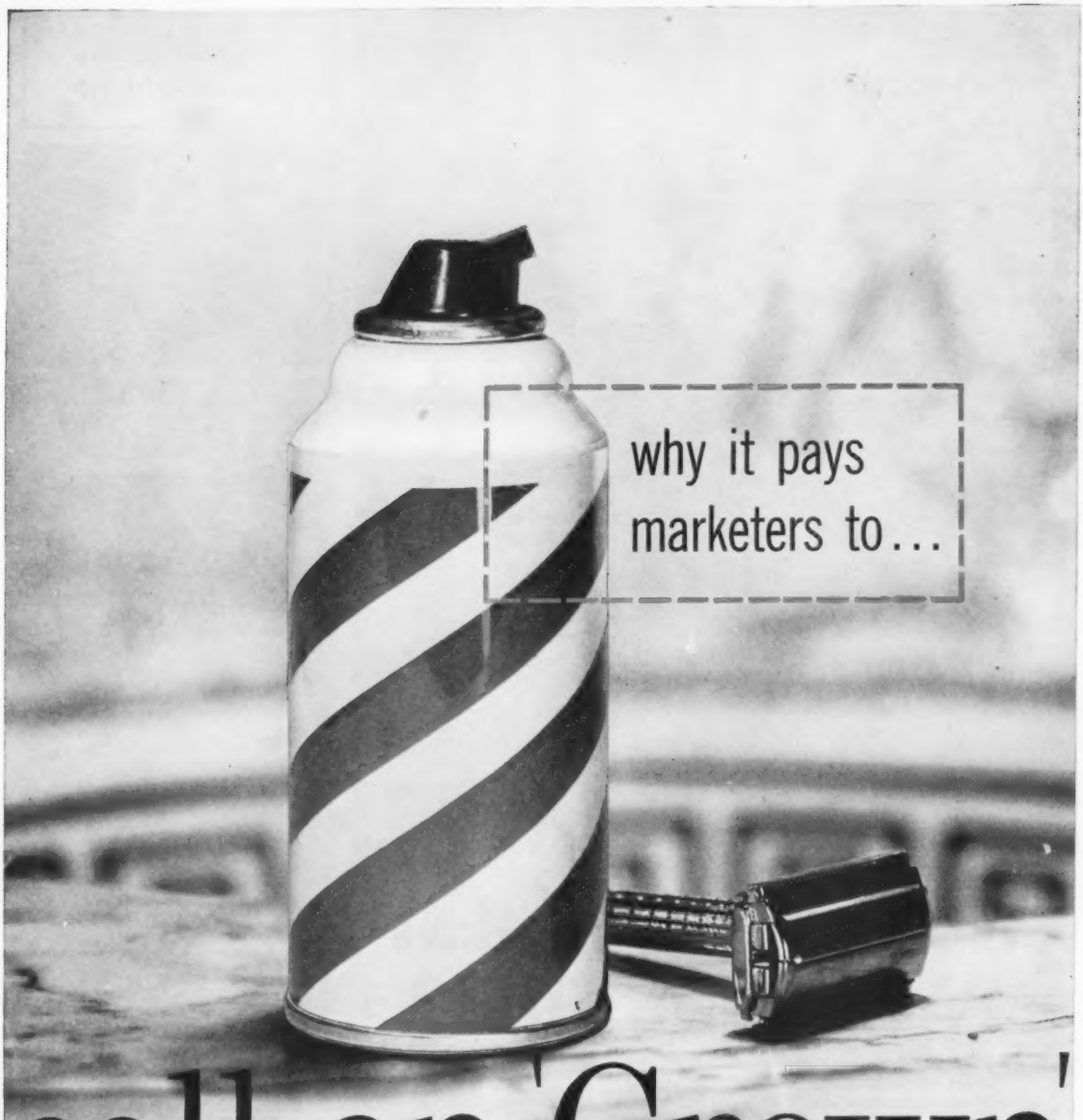
ACIDS or volatile chemicals can be packaged easily, handled safely, shipped without fear in heat-sealable containers of new "Scotchpak" Polyester Film. Also lines drums and cartons.

FOOD ITEMS are packaged safely in clear-as-glass "Scotchpak" Film. Contents can be frozen . . . even boiled *right in the package*. Low gas penetration rate . . . inert and non-toxic.

METAL PARTS can be packaged dry or in oil or grease to protect them against corrosion. Transparent packages are easy to handle, easy to ship and to store. Simplifies issuing of parts and units.

FREE FOLDER shows dozens of ways you can solve your most difficult packaging and shipping problems with new "Scotchpak" Polyester Film. Just write on your letterhead: Film Products Group, 3M Co., St. Paul 6, Minn., Dept. LY-27.

The term "SCOTCHPAK" is a trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N. Y. In Canada: P. O. Box 757, London, Ontario. © 3M Co., 1956.



Spra-Tainer, the first "throw-away" pressure package, set new standards of design efficiency and convenience.

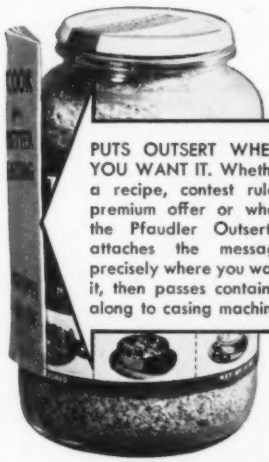
The extra strength of Spra-Tainer gives marketers a wider choice of propellants. Unique "no side seam—no top seam" construction permits uninterrupted inside coatings for best product protection. Crown's "wrap around" lithography gives marketers that vital extra spark at the point-of-sale.

Crown also provides authoritative facts on the adaptability of a product to pressure packaging . . . on pertinent Government and ICC regulations . . . on propellants, valves and contract loading facilities as well as the loading equipment itself.

You will find that this "one company responsibility" in pressure packaging pays real dividends when you . . . *call on Crown.*

CROWN CORK & SEAL COMPANY, INC., PHILADELPHIA 36, PENNA.

UP TO 220 OUTSERTS PER MINUTE attached automatically—expensive hand labor eliminated. Pfaudler Outserter handles cylindrical and rectangular containers of tin, plastic, glass or paper. Adjustable feature permits a wide choice of container sizes.



PUTS OUTSERT WHERE YOU WANT IT. Whether a recipe, contest rules, premium offer or what, the Pfaudler Outserter attaches the message precisely where you want it, then passes container along to casing machine.

Here's how you can move your product faster

Apply sales messages to outside of your package automatically—economically

You no longer need to hide your promotion literature where it can't be seen.

Here is the only machine on the market that applies outserts automatically to the outside of cylindrical and rectangular packages at speeds up to 220 per minute. Each outsert is placed on the container just where you want it—never covers an important part of the label. The machine becomes a part of your packaging line, synchronizing with the labeling machine. The Pfaudler outserter completely eliminates costly hand labor—pays for itself in no time.

But even more important it helps sell your product faster. For example, one user stepped up his product sales over 50% in a short period of time without increasing his advertising expense.

Now that the cost of doing the outserting job is no longer a factor, get the jump on competition by using them first. *You can attach almost anything you want to rigid cylindrical or rectangular packages of any material.*

Call your nearest Pfaudler office for help or send us a sample container and indicate where outsert should be attached. We'll be glad to give you all the facts. Bulletin 933 contains all specifications. Ask for it.

THE PFAUDLER CO. **Rochester 3, New York**

"This box speaks for itself!"

Oaktron packs 48 sensitive speakers with only three corrugated packing pieces, provides outstanding brand identity. Want fast packing? Real product protection? Superb printing? Better see H & D.

HINDE & DAUCH

Subsidiary of West Virginia Pulp and Paper Company

AUTHORITY ON PACKAGING • SANDUSKY, OHIO
14 FACTORIES • 42 SALES OFFICES

Here is an effective way to cool a product prior to packaging it. Because Plough had to deliver its Moroline to the packaging line with its temperature between 125 and 130 degrees F, its engineers had to devise a cooling method in order to drop the temperature to about 108 degrees for filling. This article tells how they did it and reviews the Moroline packaging line operation — with emphasis on its special features conducive to effective packaging.

Technique of product cooling key feature of packaging line

Borrowing a technique from the dairy industry, Plough, Inc., Memphis, Tennessee, proprietary drug product manufacturer, found a way to cool Moroline petroleum jelly in the course of a packaging operation. A reasonable period of experience confirmed the effectiveness of this transplantation of a cooling method. Further, the Plough engineers have installed other equipment and methods contributing to increased packaging efficiency.

Special features of this line include a method of removing air from the product prior to packaging, a heat application to prevent cooling of product in movement, an inverted jar detector, and a simplified method of loading and unloading cases of jars. All of this results in a packaging line that operates at 120, 56-gram jars a minute. Further, this production is maintained during normal shift — with the result that the line turns out 4000 dozen units in eight hours, with four operators. A quality product is the result, according to Plough engineers, who point out there are no air bubbles, greasy jars, and no complicated to-and-fro cooling—with its attendant equipment.

Handling Of Glassware

Start and finish of the line is a section of roller conveyor mounted on the floor. This conveyor holds pallets of empty glassware and filled jars in cases. An innovation on this line is the use of just one man to unload empty glassware and load filled cases.

Within his reach are both the unscrambler for empty jars and the conveyor holding sealed cases of finished product. The attendant works with both pallets at the same time. He is not only taking cases of empty jars from one pallet but also is building up a load of filled cases on another pallet.

Crux of this operation is his use of a circular motion. As soon as he positions a loaded case on the pallet he is building up, his arms move directly to the pallet containing empty glassware. He frequently handles more than one case of empty jars at a time. Each case holds 24 56-gram jars.

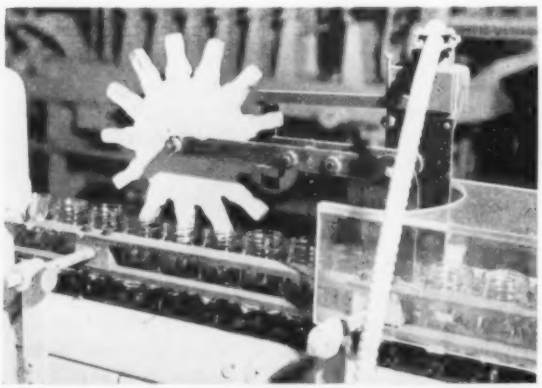
As he takes each case of empty jars he dumps it on the tilt-top loading table of an Island unscrambler. Leaving the unscrambler, the empty jars pass under an air jet, after which they move on a conveyor through a Plexiglas hood. This protects the cleanliness of jars all the way to the filler.

Spotting Inverted Jars

Just before entering the Kiefer Visco filler, jars pass under a safety device of the plant's own development. It utilizes a rotating wood wheel that has long teeth that are somewhat like pointed spokes. The number and shape of these teeth co-

Principal packaging machines on the Moroline line stand within a U-shaped layout. This lets one mechanic service all three machines. He runs the filler, capper, and labeler, taking care of its normal operation as well as adjustments and stoppages. Because of this, the girl seen in the center is no longer needed; she has been released for work elsewhere in the plant.

Operator is unloading jars from cases onto an Island unscrambler. He also stores filled cases of finished goods, working on the pallets, as seen in background. Metal guide at left facilitates his emptying the cases of glassware.



This is an automatic jar detector with a cut-off control to the Kiefer filler. It assures that jars are right side up prior to entering the filler. If a jar is upside-down, the tooth or spoke cannot enter it and the wheel stops, thus actuating a microswitch to stop the filler. Lawrence Hubbard, Plough plant engineer, designed this device.

incide with the movement of jars on the conveyor. As a result, each tooth or spoke goes into the open neck of an empty jar.

If for any reason a jar is upside down, the spoke cannot enter it. When this happens the stopping of the wheel actuates a micro-switch. As soon as this takes place the filling machine stops.

Meanwhile, the product itself is undergoing preparation for packaging. To facilitate its movement it is heated to 125-130 degrees F. Before it can be packaged the temperature must be dropped to 108 degrees F, plus or minus four degrees. Also, it is necessary to remove the air from the formula.

Upon arrival in the packaging room the product goes into an overhead supply tank. From here it feeds by gravity to an air-removing unit developed by Plough engineers. The air is removed by vacuum pump equipped with a regulator and gauge. Normal operation calls for vacuum setting at 22 inches.

Since the material had to be heated for its removal from bulk storage in the plant's tank farm, for pumping through overhead lines to the packaging room, its cooling was something of a problem.

Idea: Use A Votator

Some time ago, however, Hugh F. Crawford, the company's engineering manager, got the idea of using a standard Girdler Votator to cool the petroleum jelly. He thought it would do this in the same way it cools ice cream in a dairy plant. The idea worked.

The company engineers installed a pump in the line between the air removing unit and the votator. This pumping action forces the petroleum jelly into the votator. Its cooling unit uses Freon 12. There is a circulating system between the filler and the votator.

Principal problems arising in connection with the use of the Freon unit were getting the correct size of compressor and determining the proper cooling time.

Illustrative of the difficulty of handling petroleum jelly is the use of

infra-red heat lamps. These are installed on the sight glasses on the tanks in the packaging room. Purpose of the heating action is to prevent the product from congealing and solidifying in the glasses.

From the votator the product is pumped to a Kiefer filler. A special feature of this machine is that the filling platforms are non-elevating. The plant mechanics removed the cam tracks and the lifts. In this way, the platforms remain at the same level during the filling cycle, instead of elevating. The company engineers believe this non-elevating feature, for this particular operation, is advantageous — and gives a 15% to 20% increase in efficiency.

After being filled the jars index out of the machine for movement to the capper. A Plexiglas hood covers the conveyor leading to the capper.

An innovation of the line is the use of a hot plate built into a table. This acts as a heater for partially filled jars in case of a stoppage — jars remaining at this point at the end of a run.

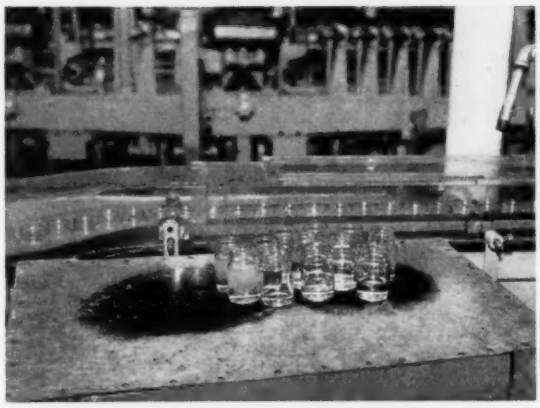
What happens is that the product cools and solidifies after getting into its jars. This is the case where jars are not immediately capped. By placing these jars on this hot plate the line attendants can raise the temperature of the product in these jars to as high a point as necessary — but not to exceed that of the filling line itself.

Filled jars move through a Consolidated capper. It has two special features. There is a tray which has been installed around the machine to catch excess or falling caps. Also, there is a specially built hopper to provide an increased supply of caps.

Install Inclined Conveyor

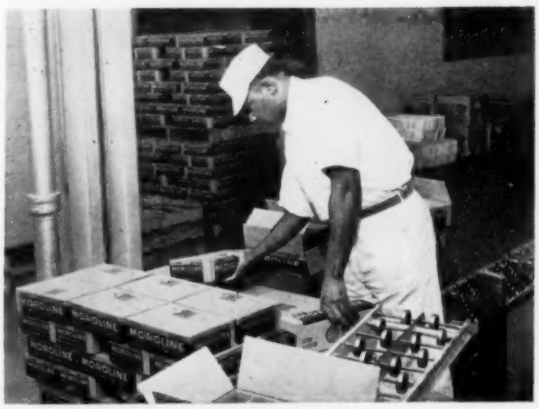
Leaving the capper the capped jars move on a conveyor leading to the case packer. This conveyor is inclined in order to reach the level of the labeler. This was done to make it unnecessary to raise the levels of the lower machinery.

In the middle of this conveyor is a semi-circular or half moon-shaped platform. It functions as a surge point to catch any overflow of pro-

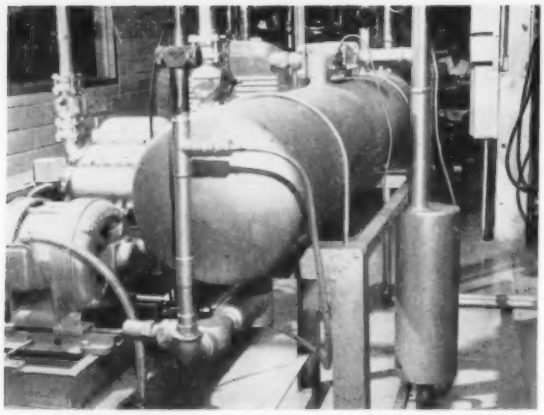


An electric hot plate under the metal top of this table is used to heat low or partially filled jars, such as might be necessary in case of a stoppage, in order to save the product in the jars. The main flow of jars takes place under the Plexiglas covers on the discharge conveyor of the Kiefer twin stream filler.

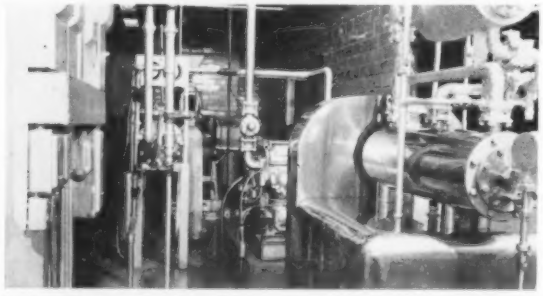
Case packing station uses a Standard-Knapp jar case packer and a skate conveyor (foreground) for the movement of empty cases. In center background is the A-B-C short case sealer. Note that the case packer and case sealer connect by an inclined section of roller conveyor.



Plant layout is such that the operator who unloads the empty glassware can also build pallet loads of filled cases using the pallets seen in foreground. In this plant all work moves more or less in one direction. Materials and supplies come in from one side and finished work moves out the other side of the packaging room.



At left is the compressor and in the right foreground is part of the cooling system, with the Freon 12 condensor. These connect to the Girdler votator. Getting the correct compressor size and determining the proper cooling time were important phases of Plough's project.



In the right foreground is the Girdler votator and on the left is the electrical control panel. To left of center is the Freon 12 condensor, and to the right of center is the compressor. Underlying objective of this project was to cool the Moroline petroleum jelly in the course of packaging it.

Overhead supply tank for Moroline petroleum jelly has an automatic remote pump control and temperature control, as well as a thermometer and sight gauge — with heat lamps near the sight gauge. Heat from these lamps prevents the product from congealing and solidifying in the glasses.

duction. If the case packer is stopped momentarily, the capper may continue to operate.

From this conveyor the filled and capped jars go through an Economic labeler. Leaving the labeler, the jars move to a Standard-Knapp four-lane bottle packer. Cases used here are the same ones in which the empty glassware arrived.

Before jars enter the case packer, they pass the station of a girl who inspects each one. She checks all jars for physical and visual condition. Where necessary she soaks off labels so that jars may be relabeled.

Using A Mechanic

A mechanic operates the filler, capper and labeler. The reason for using him instead of a typical operator is so that he can take care of adjustments and break downs, as well as look after normal operation. These machines are positioned in a U-shape, so that all three are readily accessible to this mechanic.

Once the loaded cases leave the packer they move on an inclined conveyor to an A-B-C short case sealer. This unit is standard except for an infeed guide rail which the plant installed to facilitate the closing processes for the particular cases used, by holding in the top inner flap.

Sealed cases emerging from this machine move down a conveyor to the loading point. Here, the same man who unloaded the empty glassware places the filled and sealed cases on the waiting pallet. From here the loaded pallets move by fork lift truck to a storage area, for shipment.

The layout of the Plough plant is such that all work moves more or less in one direction. Raw materials and other supplies arrive on one side of the building and move through the production area. Branching off a corridor in the center of the building are the various air conditioned packaging rooms of which the petroleum jelly operation occupies one. Finished work leaves this room (just as from the other packaging rooms) for shipment from this end of the building. This is the opposite end or side at which materials and supplies enter.

A simplified structural organization for packaging and use of the foreman as a focal point — these are among the keystones of the packaging operation for the Farm Equipment Division at the West Allis Works, Allis-Chalmers Manufacturing Company. In this article Mr. Baskin builds a strong case for the key role of the foreman, and outlines some significant packaging practices and policies to follow.

The foreman's place in the packaging operation

By David Baskin,
Superintendent of Material Control, Tractor Group, West Allis Works
Allis-Chalmers Manufacturing Company
West Allis, Wisconsin

As the trend to more and more packaging of individual items such as tractor parts continues, the foreman in charge of the packaging operation occupies an increasingly important role. We find that by giving him responsibility and allowing him to use his judgment, our packaging operations continue to improve.

For the farm equipment division of the tractor group at West Allis Works, the packaging function is a phase of the material control department. All packaged items are shipped from storage as a general practice, rather than by direct shipment which takes place only under unusual circumstances.

We currently handle more than 2,000 different items on a single set of packaging lines. Every year we add to these items. We seem to need more and more protection because there are closer tolerances on parts, finer machining, and the need of individually packaging parts that present inherent hazards, such as the rubbing together of components.

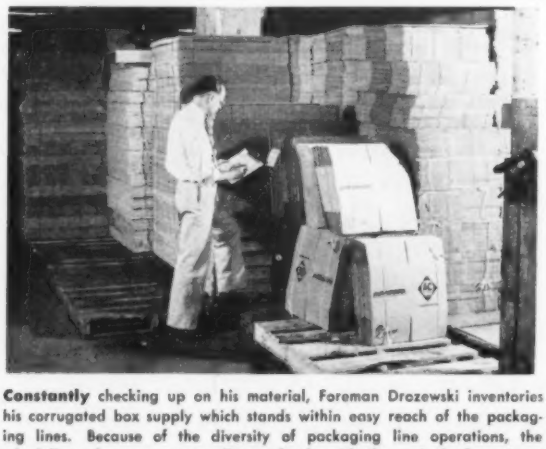
Packaging And Storage

Our packaging operations relate very closely to our storage situation. This, in turn, more or less synchronizes with the demand for packaged parts for the various Allis-Chalmers products. Our general practice goes like this: When we find we are down to a four-month supply, we reorder a four-month stock, based on experience of the past twelve months. We try to maintain a 60-day supply of packaging material and seek to schedule materials and containers to arrive at approximately the same time — to avoid having excessive quantities of items in storage in the packaging area of our plant.

Once the foreman in charge of packaging gets his instructions from the material control department con-

Author Baskin keeps in close touch with his foremen. While Matt Fettig, foreman in charge of belt conveyor operations in the packaging department looks on, Mr. Baskin shows Harry Drozewski, packaging department foreman in charge of roller conveyor operations, an article from a technical publication. Not only do foremen receive pertinent literature but also they have opportunity to discuss problems with supplier representatives.

Emphasizing the importance of check weighing every package to insure accuracy in the number of items in each, Foreman Fettig shows a packaging line attendant just how to handle a check weighing operation. Allis-Chalmers feels that accurate content is of sufficient importance to justify weighing every package going through its lines. Reason for this is that many of its items are sold in sets — with a user dependent on having a complete one.



Constantly checking up on his material, Foreman Drozewski inventories his corrugated box supply which stands within easy reach of the packaging lines. Because of the diversity of packaging line operations, the scheduling of runs must coordinate closely with the arrival of pertinent packaging materials.

David Baskin joined Allis-Chalmers following his graduation from high school in 1925 and assumed charge of foundry stores. Later he was named in charge of tractor stores and subsequently appointed assistant superintendent of material control. Since 1948 he has been superintendent.

cerning items to package, he reviews the packaging orders and schedules the necessary containers, etc., delivered to the line so that their arrival coincides with the arrival of the parts to be packaged. Close supervision pays dividends.

From this point on, the foreman, through the use of set standards and his own judgment, determines packaging requirements. Of course, many items are packaged repeatedly and the foreman faced with one merely refers to his records and follows the established procedure. However, since we are packaging more and more items for the first time, the foreman

must work out his protective packaging as he sees fit.

Primarily he does this on the basis of previously set standards for comparable material, and his own experience and judgment. For example, take the case of an oil gauge. He knows from experience that he cannot, without the additional cost of pre-wrapping, put it into a tuck flap container because dust would get through the flaps of the carton. He would then recommend a moisture-proof, dust-proof, sealed container, eliminating pre-wrapping of the part.

Reaching Decisions

Often a packaging department foreman lays out the parts received that are to be packaged and from experience recommends the type of containers or packaging to use. He then records this on a packaging recommendation which goes to various other departments involved: sales, purchasing, engineering, as well as the superintendent of material control, for approval. We do not have a packaging committee as such, but department heads or their representatives act informally as a committee.

When outside assistance is wanted in a packaging decision, it is available either from within or without the company. For example, our company chemical laboratory made some very elaborate studies on the subject of rust preventives and established definite standards and specific treatments. As a matter of policy, every part going into the stock room is rust-proofed where exposed surfaces suggest it be done.

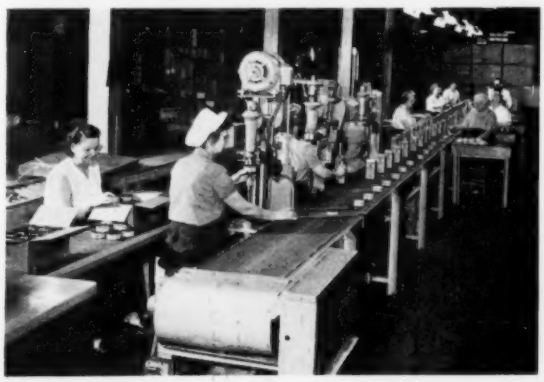
Some of these are processed for storage just as received from the vendor. There is a treatment station which is part of the packaging line and which has mechanized equipment for the dipping of parts before they reach the belt conveyor. The point is that a foreman has the advantage of detailed studies from the laboratory, which are in convenient booklet form for his easy reference.

Help From Suppliers

In other situations the company depends on the laboratory facilities

Preparatory to packaging, these cylinder liners and piston rings receive a protective coating from this dip tank. These are parts of wheel tractor engine parts kits. Packaging line foremen, as well as operating executives, have the benefit of Allis-Chalmers laboratory research on various rust preventive treatments.

Positioning of belts and conveyors alongside these units of packaging machinery illustrate the Allis-Chalmers policy of making its packaging sequences take place on a line rather than a bench basis. These girls attend the ceiling and multiple pack operations. Note that belts are positioned at a correct height for easy access by machine attendants.



Arrangement of facilities makes possible the packaging of three different items on this one line at the same time. Each of the can closing operators occupies a correct position for removal of packages from the belt for the closing sequence. Completed packages go into cases, as seen at left, for movement from the line.

Operating just in advance of the can seamer, this check weighing station is illustrative of a battery of such equipment used on Allis-Chalmers packaging lines. Because of the difficulty of counting the components in each package, it is standard practice to check weigh every one going through the line. Even when the parts are extremely small in size the scales detect missing items.

End of one packaging line is this wire tying station where corrugated cases containing various individual packages receive final securing prior to movement out of the packaging department. The arrangement of facilities gives the girl all the needed equipment and supplies within easy reach. She can do her job with a minimum of footwork.

of its suppliers. This is particularly true with regard to packaging materials. Since the supplier has these facilities available, the company simply takes full advantage of the technical and operational knowledge these suppliers offer.

To fortify the foreman in such matters, there are definite procedures by which to keep him informed on packaging developments. The superintendent of material control forwards all current publications or articles of particular interest to the packaging foremen and also sees that they have the benefit of first hand information from supplier representatives.

We find it valuable to see suppliers' representatives. The time we give them is well used because the visit gives us the benefit of whatever current information they have. Where necessary or convenient, such a representative visits the foreman on the line.

Aside from decisions concerning packaging specifications and materials, we give our foremen authority to run the packaging line and switch production in order to balance out runs to coincide with the demands of the stock room.

Training For Packaging

The foreman has responsibility for training the workers on the packaging line. The lines are set up to run progressively so that each one does his particular job, such as positioning or spotting an item to be packaged in sequence. This is a great help to some people on the line who are physically handicapped.

Aside from reducing each task to its essentials, the foreman also has the responsibility of training the crews so that the different members of the line crews are interchangeable.

A major point of the packaging operation, and a factor that contributes to the success of the foreman in managing his crews, is the use of the belt rather than the bench operation. The work is laid out for the people on the line, and the packaging people find it more convenient to work with the conveyor and thus make for a better operation.

Packaging Quality

Another phase of the foreman's job is maintaining the quality of packaging. For example, there are certain group items, such as piston rings, where a package must contain an exact number of the items. We regard this as of sufficient importance to justify our checking every outgoing package. We have scales that are so sensitive that a single extra sheet of wrapping paper will be indicated. We think it is most advisable to check every package rather than merely spot-check.

A Foreman's Qualifications

Qualifications for a foreman include a desire for this kind of work, close attention to detail, a distinct interest in the requirements of packaging, and ability to work with people. Shipping department experience is very helpful.

However, as with any job, his interest in the work is the key to his success as a packaging foreman.

tidbits or tokens . . .

M&M'S CANDIES AND PHILADELPHIA'S HANDY-PACK OF SCHOOL SUBWAY TOKENS . . . USE HEAT-SEAL POUCHPAK*. . . MADE, PRINTED AND POLY-COATED BY RIEGEL. *TM.

Whether you want to protect the sales-winning qualities of a toothsome product . . . or need to package something that's never been packaged before . . . you'll discover big savings in Riegel functional papers. Riegel does it for you by creating the right combination of the most efficient packaging materials . . . and by "tailor-making" the paper to run and seal at high speeds on your machines. Tell us what you want paper to do for you.
Riegel Paper Corporation, P. O. Box 170,
Grand Central Station, New York 17, N. Y.

Riegel

PROTECTIVE PAPERS FOR PACKAGING

GLASSINES AND GREASEPROOFS
Plain • Waxed • Printed
Lacquer-Coated • Laminated

George E. Siebel holds B.S.L. and LL.B. degrees from Northwestern University and has been associated with Central Products Company and its subsidiaries in technical and management capacities for the past 24 years. During the war years, he was active in dehydration work with Little and Company, Inc., and the National Dehydrators Association. Since 1951, he has headed The Cenpro Corporation, contract packaging and compounding firm. He is a member of Institute of Food Technologists, American Society of Brewing Chemists, American Chemical Society and Packaging Institute.

Here are some practical ways of anticipating and minimizing the difficulties usually inherent in short runs. As a contract packager Mr. Siebel has had more than ordinary experience with the vagaries of these runs. His observations should benefit anyone concerned with short runs, since his problems are not unique but typical — more typical than many packaging specialists may realize.

Problems of short run packaging line operations

By George E. Siebel,
President, The Cenpro Corporation, Northfield, Illinois

It is a rare and fortunate production man who can entirely escape the need to set up for a short production run at some time or another. Unless he has developed some defenses against such an occurrence he may find himself severely tried when his day arrives. Our purpose in this article is to develop at least a few psychological reserves against such an event.

Preparation is the key work in this type of situation, both as to organizational and mechanical problems. It is axiomatic that the short run requires almost more time spent in preparation than in production. Hence the adage, "Time saved preparing later spent in swearing."

One of Mr. Production's greatest dilemmas is imagineering the cost of turning out "say 100,000 packages — just enough to test the Grand Rapids market." It is difficult for him to convey to the merchandising or development departments the extent of the problem which confronts him. In order for the test item to conform to competition and to bear a reasonable resemblance to the items which will follow it into the market should it prove successful, it must be produced on automatic machinery.

Unfortunately, however, the equipment involved usually requires hours of skillful adjustment and revision to handle the proposed item with any degree of efficiency. It is rare that a machine can be shifted from the filling of one material to another which has never been handled on it before without a good deal of cut-and-try tinkering.

The oft-repeated chant of the machinery manufacturer that change-overs can be effected in a matter of minutes is belied by the time spent in his own shop readying a new machine for the demonstration shake-down run. While it is true that a machine which has been specifically engineered to handle two or more products can be shifted from one to the other with minimum delay, we must remember that much time was previously spent on "preparing" this equipment for its multiple functions.

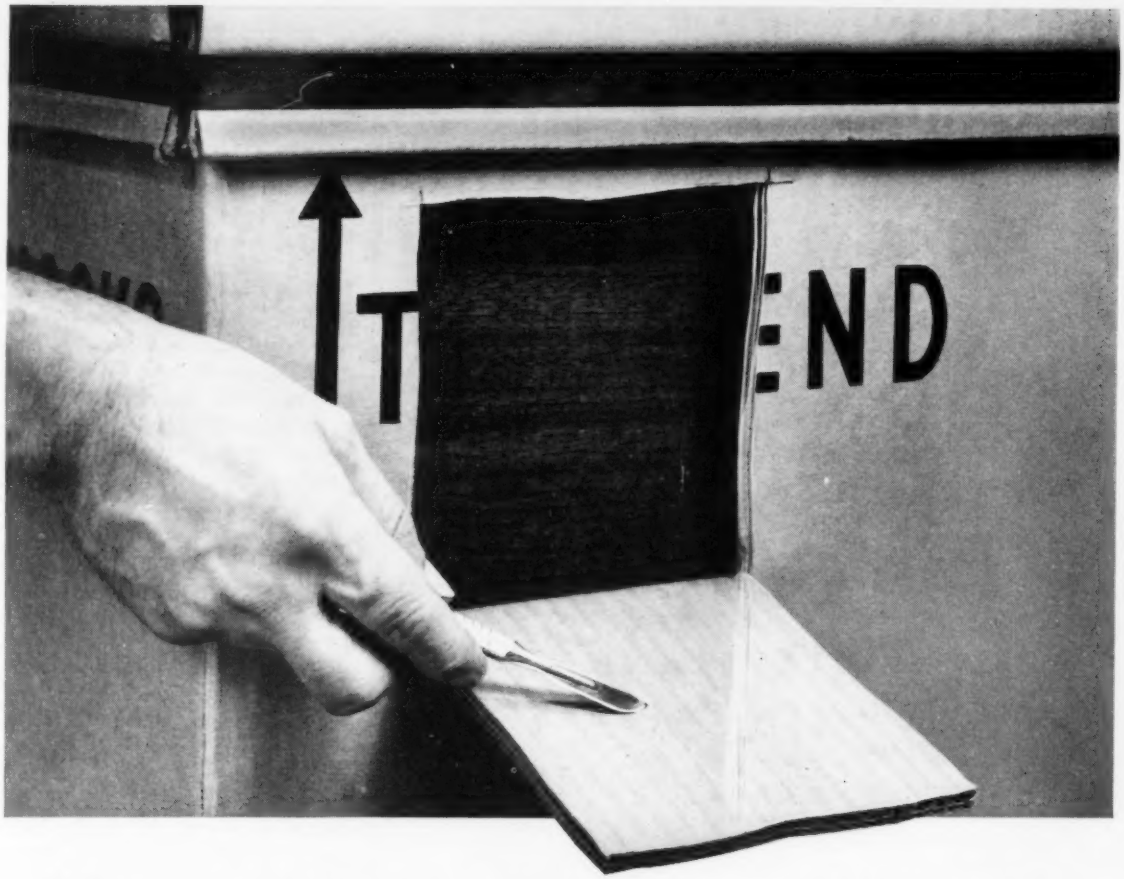
At best, then, we must recognize that the short run involves making a choice between costly preparatory engineering which may not prove to have been justified if the product does not find consumer acceptance, and the alternative of making a "jerry-rigged" setup and nursing it through a short, but frequently startlingly inefficient run.

Watch Out For These

In addition to possible mechanical difficulties let us look for a moment at a few of the other factors which contribute to excessive time and cost on short runs:

1. Late delivery of any one of the several components of the finished packages may cause considerable delays in starting.

2. Imperfections in the packaging film such as indistinct or misplaced



New coating stops fiber scratch, ends need for carton linings

Better protection in shipment for furniture, appliances and other products is now possible without cut-paper or synthetic fabric liners in corrugated cartons.

Coating your corrugated cartons with A-C POLYETHYLENE *alone* or with an A-C POLYETHYLENE-wax blend provides greater protection against scratch and eliminates labor costs for inserting linings. Because A-C POLYETHYLENE holds down paper fibers securely, you get far greater strength of film than paraffin provides, yet it is as simple to apply.

A-C POLYETHYLENE is the low-molecular-weight, low-viscosity polymer that handles easily and can be applied using standard wax-coating procedures. It has high resistance to grease and scuff and far less rub-off than ordinary wax coating. These excellent characteristics can now be applied to your cartons. Ask your wax supplier for the A-C POLYETHYLENE-WAX blends you need.

Write us for information, samples and price lists on A-C POLYETHYLENE. Technical sales representatives are available from coast-to-coast and in Canada. For addresses and phone numbers, ask for Bulletin 116.

A-C Polyethylene

*Trade-mark

DISTRIBUTORS

L. H. Butcher Company
15th and Vermont Streets
San Francisco 1, California

Moreland Chemical Company, Inc.
Box 2437
Spartanburg, South Carolina

Thompson-Hayward Chemical Co.
29th and Southwest Boulevard
Kansas City 8, Missouri

Canada Colors & Chemicals, Ltd.
1090 King Street West
Toronto, Canada

SEMET-SOLVAY PETROCHEMICAL DIVISION
Allied Chemical & Dye Corporation
Room No. 502-M
40 Rector Street, New York 6, N. Y.

Allied Chemical

Please send me Bulletin 116 and samples of A-C POLYETHYLENE.

Name_____

Company_____

Address_____

City_____ Zone____ State_____

in CLEVELAND CONTAINERS

Have you, too, a packaging problem? The answer may be one of our conventional composite containers . . . or one specifically designed to fit your product. Whatever the problem, let us help you.

AC SPARK PLUG chose a CLEVELAND CONTAINER to package their tachometer. This sensitive instrument is adequately protected in a convenient, attractively labeled container. . . . an example of a packaging problem competently handled by our design department.

Remember, the most satisfactory method of supplying a GOOD PRODUCT to the consumer is in a distinctive, properly designed and constructed container.

Write for packaging brochure.

Why pay more? For quality products . . . call CLEVELAND!

THE CLEVELAND CONTAINER COMPANY

6201 BARBERTON AVE., CLEVELAND 2, OHIO

PLANTS AND SALES OFFICES: CLEVELAND, DETROIT, CHICAGO, MEMPHIS, LOS ANGELES, PLYMOUTH, WIS., JAMESBURG, N. J., OGDENSBURG, N.Y. • ABRASIVE DIVISION CLEVELAND

SALES OFFICES: NEW YORK CITY, WASHINGTON, D. C., ROCHESTER, N. Y., WEST HARTFORD, CONN.

• ALL-FIBRE CANS • COMBINATION METAL AND PAPER CANS • SPIRALLY WOUND TUBES AND CORES FOR ALL PURPOSES

CLEVELAND CONTAINER CANADA, LTD.
Plants & Sales Offices: TORONTO AND PRESCOTT, ONT. Sales Office: MONTREAL

registration spots, too frequent splices, delamination or improper extrusion causing curling of partially finished packages — any or all of these may result from the unavoidable incidents involved in short runs at the converting plant and may lead to considerable loss of both film and production in the hands of the packager.

3. Lack of specific experience on this job inevitably causes awkwardness on the part of personnel as well as on the part of the machine operator on a new run, and this leads to inefficiency for the first day or two — bear in mind that two days may constitute from 10% to 60% of the entire running time in this instance.

4. Wide fluctuations in weights may result from improper selection of filler or of filler accessories.

5. Improvised package machine parts may also prove troublesome and need constant adjustment, leading also to higher losses of materials and frequent interruptions, with consequent lowered daily output.

6. Seal difficulties may result from unexpected variations, such as decreases in density of a powder leading to overfilling of packets, excessive dusting in top seal area, or in the case of a liquid, the presence of surface activity may carry the material up into the seal area, again producing faulty seals.

Recognize Sources Of Delay

Assuming that, in spite of all your arguments, management has insisted upon your making the short run, there are some things which you can do to minimize your own problems. First of all, don't mince words about the factors of delay involved — make it very clear that the timing will be nothing like your normal production schedules.

This saves wear and tear on your alibi file when the sales department arrives at the deadline only to learn that you have not yet finished your setup. In respect to the delivery delay hazard which was mentioned above, it would be well not to start a change-over on any regular production machine until all components were *in the building* and approved from a quality control standpoint.

It is not too unusual to find packets which will not fit into a display carton, or display cartons which will not fit into a shipper. It takes time to remedy such defects and if they are not discovered until the actual run is begun you can well imagine the consternation and cost involved! This little precaution may add two weeks to your scheduling but it may

Be realistic about short runs

1. Give yourself adequate preparational and "shakedown" time before the run starts. Be generous in your time allowance.

2. Do not overestimate the yield on your supplies of packaging film — for short runs figure the tolerance on the minus side.

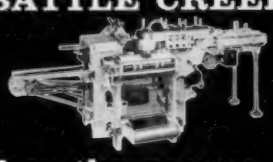
3. Be alert to performance differences between test batches and production batches of the material being packaged.

4. Verify the correctness of the dimensions of the different components of a package, such as making sure cartons fit into their shipper.

If it's a question of

various sizes

BATTLE CREEK



has the answer

Illustrated is the Battle Creek Model 47, precision engineered to handle packages from 5½" to 12¼" long, 2" to 7½" wide and 1" to 4½" high at speeds up to 75 per minute.

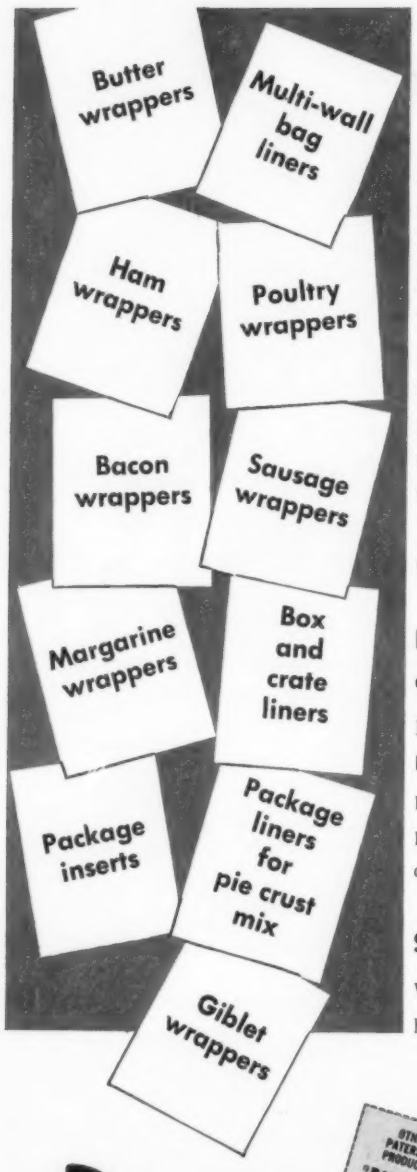
Battle Creek versatility permits wrapping of dozens of different sizes on a single machine with as little as 10 minutes changeover time. *Continuous Flow*® helps make every package an impulse selling showcase, and Battle Creek's careful engineering gives you efficient, quick-change performance and package handling at lowest cost.

LET US WRAP YOUR PRODUCT. Send us samples of your products (or if they are perishable, describe the packages and sizes) and tell us the kind of overwrapping you require. We will either wrap and return them promptly with our recommendations, or give you our best suggestions in answer to your inquiry. If you have specific questions, we would welcome a letter from you.

"*Continuous Flow*" Packaging

BATTLE CREEK
packaging machines, inc.
100 TWELFTH STREET, BATTLE CREEK, MICHIGAN

If you package foods, Patapar® can be good news for you!



Available in many different types, Patapar Vegetable Parchment offers unique qualities as a packaging material. It has high wet-strength plus high resistance to grease, fats and oils. Made from pure cellulose, Patapar is odorless and completely non-toxic. It handles easily on all types of packaging equipment.

It meets every requirement of the Federal Food and Drug Act.

Furnished plain or exquisitely printed

Patapar comes to you plain or beautifully printed by letterpress or lithography. We will reproduce your present design or create a colorful new one for you.

Send for samples

Write us on your company letterhead, telling your requirements.

Patapar®
Vegetable Parchment
HI-WET-STRENGTH · GREASE-RESISTING

OTHER PATERSON PRODUCTS
*PATAX waxed paper
*DURAPAK parchmentized cellulose
*PATERSON absorbent paper
*PARCHKIN oil parchment

PATERSON PARCHMENT PAPER COMPANY
Bristol, Pennsylvania
Sales Offices: New York, Chicago
West Coast Plant: Sunnyvale, California

HEADQUARTERS FOR VEGETABLE PARCHMENT SINCE 1885

also save considerable delay in other production — and add months to your life.

Check Material Performance

So far as the original package specifications are concerned, it is well to experiment freely with a hand sealer and the proposed film before the run is thoroughly defined. Dust a bit of the powder, or wipe a bit of the liquid which is to be packaged, into the seal area and try to seal through it. If you have difficulty, be sure that you are able to eliminate dusting or creeping in the final film before you approve the job.

Look Out For Air

Sometimes a slight dimensional or film specification change at this point may save the day later on. Remember too, in specifying display carton sizes, that there is likely to be more air in the machine packed product than in a hand made sample. Squeezing this air out of the packet at high speeds frequently produces the very dusting that makes sealing impossible.

Be Careful About Yield

There are not too many things which can be done about defects in short runs of packaging film other than to deal with reputable converters and purchase an ample supply. A frequent error on the part of overzealous film suppliers is to take an extremely optimistic view regarding yields. While all of their contracts and specification sheets show it, they are frequently prone to forget that average yields may range plus or minus from 5% to 10% of the stated amounts. It is usually safer to figure these, at least for short run purposes, as though they were assuredly on the minus side.

Between film yield shortages, and losses resulting from film defects, initial adjustments and unavoidable human and mechanical failures, you may use from 20% to 30% more film than theoretical calculations would seem to indicate. It is cheaper

(Continued on Page 46)

How "SURE-WAY" Package Casers Cut Costs, Simplify Cartoning Operations

"Utilization of your 'Sure-Way' Package Caser has reduced our direct labor from five people to one," says E. L. Marschner, Director of Operations, The Dromedary Company, Division of National Biscuit Company.

This kind of cost reduction is not uncommon wherever automatic, high-speed (up to 300 packages per minute depending on package size and casing pattern) "Sure-Way" Casers have been installed. One operator is all that's needed, with the inherent advantages of reducing labor turnover, and eliminating personnel training and substitution problems that frequently characterize manual casing operations.

Check the moderate initial investment. Look at the compactness (80% less space in some instances), the near-human performance, versatility, and gentleness to packages, overwraps and labels. This is the caser that "protects the package that protects the product," with speed, precision and profits.

Get complete details by writing, or call your nearest FMC representative.

The natural sign of natural cake

fmc

FOOD MACHINERY AND CHEMICAL CORPORATION

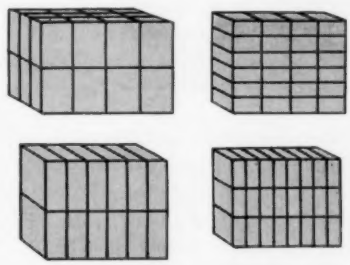
Exclusive Distributors:

FOOD MACHINERY AND CHEMICAL CORPORATION

Canning Machinery Division

General Sales Offices: WESTERN: SAN JOSE, CALIF. • EASTERN: HOOPESTON, ILL.

FLEXIBLE—HANDLES VARIETY OF PACKAGE SIZES, TOP OR END LOADING CARTONS



What case loading pattern do your packaged products take? Do you use top-opening or end-opening cases? Do you have more than one package size or case pattern to handle on one machine? Sketched above are only four of dozens of possibilities. Our packaging engineers will welcome the opportunity of reviewing your problems and making recommendations. It will be helpful if complete information is supplied with inquiry. No obligation, of course.

Write for fully descriptive Bulletin No. CMD 601-W

Barney Hilton is a graduate of Furman University with a B.S. degree in chemistry and mathematics. He has a master's degree in chemistry from Emory University, and has undertaken special studies at Georgia Tech and Massachusetts Institute of Technology. Prior to joining H. W. Lay & Co. Inc. he was with Puritan Chemical Company for two years as research and quality control chemist. He is a member of American Chemical Society, American Oil Chemists Society, Institute of Food Technologists, American Society for Quality Control, and the Package Committee of the Production and Technical Division of the National Potato Chip Institute.

Here is a unique article that should interest all concerned with the problems and mathematics of permeability. In seeking to develop a fundamental theory to explain moisture vapor transfer through packaging materials, Mr. Hilton sought to develop a theory that would be consistent with known theories of physics and chemistry. Therefore, his work makes use of well known theories of physical chemistry. Experimental work now in progress is proving the theory to be correct.

Moisture vapor transfer study results in new theory

By Barney Hilton,
Head Food Technologist,
H. W. Lay & Co., Inc.
Chamblee, Georgia

This study deals with the theoretical aspects of moisture vapor transferred by diffusion through films and papers. It is not concerned with "leakage" through "pin holes" and cracks in the materials. Throughout this paper certain ideal conditions are assumed to exist, that is, water vapor is considered as an ideal gas and the film (barrier material) is considered to be homogeneous over some finite dimension.

Most previously published work, with a few exceptions, seems to agree that the driving force for moisture vapor transfer is the difference in the partial pressure of moisture vapor in the air that is adjacent to the two sides of the film or barrier material. One notable exception to this is an article by Corte and Schock in a German publication.

They claim the driving force to be the difference in the layer of moisture vapor condensed upon the two surfaces of the barrier material, that is, the side adjacent to the humid atmosphere will have a higher concentration of moisture vapor upon the surface than will the opposite side that is adjacent to the arid atmosphere.

We shall point out later in this paper that theoretical consideration led us to agree with these latter authors. In our work we decided to begin with the following three fundamental statements that moisture vapor transmission occurs in three stages:

Transmission's Three Stages

(1) First, the adsorption of a layer of moisture vapor upon the surface of the barrier that is exposed to a humid atmosphere.

(2) Moisture is transferred through the barrier to the opposite surface by diffusion.

(3) Desorption occurs from the opposite surface to a dry atmosphere that is adjacent to that surface.

In order to develop a completely fundamental theory we made use of the following well known theories of physical chemistry:

(1) Langmuir's theory of adsorption.

(2) The Kinetic theory of gases.

(3) Fick's law of diffusion.

(4) Arrhenius theory of the effect of temperature on reaction rates.

The development of our theory must be made with the consideration of the previously mentioned stages. It must be realized, of course, that moisture vapor transfer does not take place in a discontinuous fashion but is one continuous phenomenon. The use of the idea of stages is simply a matter of convenience.

In stage one we will be concerned with the rate at which moisture vapor condenses upon the surface of the film adjacent to the humid atmosphere. It is under-

stood that this is the limiting factor for moisture vapor transfer. Without this layer being condensed upon the surface no transfer by diffusion would be possible.

Developing A Theory

The first basic statement in the theory is as follows: The rate of adsorption of moisture vapor per square centimeter of barrier surface is equal to the number of molecules striking the surface per second minus the number leaving the surface per second. Mathematically this is stated below:

$$\frac{dq}{dt} = \frac{Z - Y}{k}$$

k = Avogadro's number (the number of molecules per gram molecular weight of moisture vapor).
q = moles (gram molecular) weight of water vapor per square centimeter of dx thickness on the barrier material.
t = time in seconds.
Z = number of molecules striking the surface per square centimeter per second.
Y = number leaving the surface per square centimeter per second.

This statement is in agreement with the Langmuir theory of dynamic adsorption. It is also a matter of simple logic.

The above equation accurately expresses the rate of adsorption of moisture vapor upon the surface of the barrier material. However, the expression needs to be modified so that Z and Y may be expressed in units or in terms that can be measured and easily expressed. In order to do this, Z and Y must be related to these measurable quantities such as temperature, and vapor pressure. It is shown by the Kinetic theory of gases that the following expressions are true.

$$Z = \frac{Va}{4}$$

V = the average velocity of the molecules.
a = number of molecules of water vapor per cubic centimeter of atmosphere.

Further, by the same Kinetic theory,

$$V = \left(\frac{8 R_1 T}{\pi M}\right)^{\frac{1}{2}}$$

T = absolute temperature.
R = gas constant in ergs per degree per mole.
M = molecular weight of water vapor.

By substituting the above value for V and rearrangement we find the following expression:

$$Z = a \left(\frac{R_1 T}{2 \pi M}\right)^{\frac{1}{2}}$$

Getting Expression For Y

It is thus seen that we have an expression relating the number of molecules of water vapor striking one square centimeter of surface per second to the absolute temperature, moisture vapor concentration in the air, and the molecular weight of the water vapor molecule. In order to develop an expression for Y, that is, the number of molecules leaving the surface per second, we shall resort to the following theory:

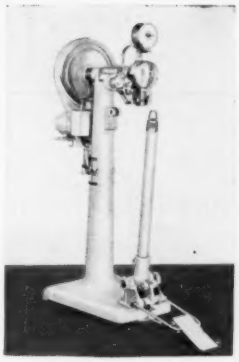
Let C = moles of water vapor required for saturation of the film at that atmospheric condition per square centimeter of dx thickness. By Langmuir's theory the rate of evaporation is proportional to the area covered.

Get High-Speed, Uninterrupted Stitching with

MID-STATES

Turn to Mid-States for fast, economical production and packaging. For over half a century Mid-States has led in consistent, high product quality and cost cutting know-how. Whatever your packaging need, it will pay to do business with Mid-States.

MID-STATES STITCHING WIRE on fibre throw-away spools gives you frictionless, uniformly smooth flow — off the coil and through the stitching head—to assure high speed, uninterrupted operation. *Available in 5, 10, 25, 50 lb. spools. All Standard gauges. Special gauges on request. Galvanized and copper-coated finishes.*



MID-STATES BOTTOM STITCHER MACHINE staples carton bottoms up to 72" wide, 40" deep. Effective on board stock to a maximum thickness of ⅜". Single foot pressure on saddle plate brings Bottomer Post into position. The famous "Tip-Toe" contact on electric switch starts and stops stapling. *Stapling Head Arms in 12, 30, 36 inches in length. Straight Arms and Sword Arm types also available.*

MID-STATES WIRE TYING MACHINES are your fastest, most economical means of assuring safe, intact shipments of products. Mid-States "T" model is the answer—it's simple, streamlined and fast! Moving handle forward and back tensions, ties, cuts wire in one easy operation. Mid-States supplies the wire to use with each machine.

MID-STATES STEEL AND WIRE COMPANY
CRAWFORDSVILLE, INDIANA • JACKSONVILLE, FLORIDA

For more information circle No. 218 on Card

Distinguishing the theories:

As Mr. Hilton notes there is a difference between his theory and most such theories which have appeared prior to his. These have claimed that the vapor pressure difference in water vapor across the film is the driving force for the water vapor transfer. They also have asserted that the rate of transfer is *linear* with the water vapor pressure difference. In contrast, Mr. Hilton suggests that the water vapor concentration on the surface is the driving force. He says it depends more nearly upon relative humidity than on absolute humidity; most of the former theories rested on an absolute humidity concept. Also, his theory indicates that the water vapor transfer rate varies *logarithmically* with the vapor pressure rather than in a linear manner.

By area, of course, it is meant the potential area that is available for condensation at that particular atmospheric condition. Mathematically, then the following expression is valid:

$$Y = i\,\frac{Q}{C}$$

Q = moisture vapor concentration.
C = equilibrium moisture vapor concentration.
i = a constant.

Now our original equation

$$\frac{dQ}{dt} = \frac{Z-Y}{k}$$

becomes by substitution

$$\frac{dQ}{dt} = \frac{1}{k}\left[a\left(\frac{R_1 T}{2\pi M}\right)^{\frac{1}{2}} - i\,\frac{Q}{C}\right]$$

by the fundamental gas law

$$PV = \frac{a}{k} R_2 T$$

R_2 = Ml atmospheres / mole degree
T = Temp. absolute
P = vapor pressure
V = volume (1 cc)

$$a = \frac{kP}{R_2 T}$$

by substitution for a we have

$$\frac{dQ}{dt} = \frac{1}{k}\left[\frac{kP(R_1 T)^{\frac{1}{2}}}{R_2 T(2\pi M)^{\frac{1}{2}}} - i\,\frac{Q}{C}\right]$$

or

$$\frac{dQ}{dt} = \frac{1}{k}\left[\frac{k g P}{(2\pi M T)^{\frac{1}{2}}} - i\,\frac{Q}{C}\right]$$

"g" is a constant and equals $\sqrt{R_1}/R_2$

Now by considering surface condensation alone and if equilibrium were established

$$\frac{Q}{C} = 1$$

and $$\frac{dQ}{dt} = 0$$

Therefore, $$\frac{kPg}{(2\pi MT)^{\frac{1}{2}}} - i = 0$$

or

$$\frac{kPg}{(2\pi MT)^{\frac{1}{2}}} = i$$

By substitution for i and rearrangement

$$\frac{dQ}{dt} = \frac{gP}{(2\pi MT)^{\frac{1}{2}}}\left(1 - \frac{Q}{C}\right)$$

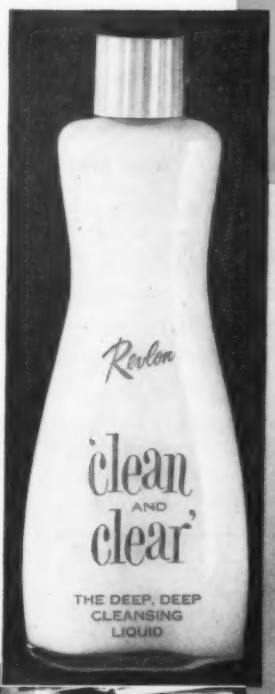
It is seen from the above equation that the rate of adsorption of moisture onto the surface of a film at any time is proportional to the vapor pressure of water, the distance from equilibrium, and inversely proportional to the square root of the absolute temperature.

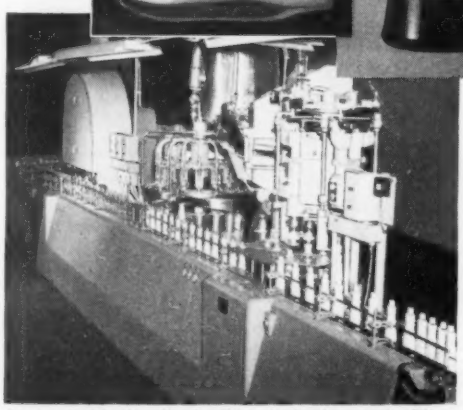
Consider Diffusion Stage

At this point we should consider stage two or the diffusion stage. It should be assumed that some moisture vapor gradient exists across the film and this additional moisture concentration next to the humid atmosphere is the driving force for our stage two or the diffusion stage. Consider a film of x thickness with a moisture concen-

fill your products faster at LOWER operating cost
with the
GEYER
TEN LINE FILLER
GEYER ten line piston filler with separate motor driven agitator, rollover, cleaner and automatic feeding device
You can fill your semi-liquid and semi-solid products faster and more economically with the GEYER ten line filler. This sturdy unit offers operating economies no other filler can offer plus:
• filling speeds up to 200 containers per minute
• versatility of products handled including food, dairy, paint and chemical products
• simplicity of operation
• versatility of containers handled — from 2 oz. to gallon containers
• easy cleaning, fast change-over
• positive, accurate filling
• sanitary construction around the filling zone
Write, wire or call for more details on the GEYER ten line filler or our other fillers to meet the needs of the small and large packer.
See our exhibit at Booth 45 at the Canners' Show
THE FILLER MACHINE CO., INC.
12 PENN AVE., ROCKLEDGE, PHILA. 11, PA., PIlgrim 5-0170
the original builder of Philadelphia piston fillers

REVLON'S WINNING ANSWER IS...





Synchronized bottling line handling air cleaning, gravity filling and rotary capping at Revlon's plant in Passaic, N. J.

PNEUMATIC for cleaning, filling, capping and labeling

There's a very practical side to REVLON'S brilliant success with its notably glamorous products. Smart advertising, promotion and merchandising has been matched by skilled production — including, in the packaging phase, highly effective use of PNEUMATIC equipment.

Cleaning, filling, capping and labeling of REVLON containers calls for precision performance, due to the "high style" nature of the containers, caps and labels. Gentle handling at uninterrupted high speeds is an in-built result of the advanced design and exceptionally expert engineering that are the very heart and soul of PNEUMATIC machines. America's leading producers of both wet and dry products use more PNEUMATIC equipment than any other make, by far — simply because PNEUMATIC means "lower cost per container" operation, every time.

PNEUMATIC SCALE CORP., LTD., 77 Newport Ave., Quincy 71, Mass. *Also: New York; Chicago; Dallas; San Francisco; Los Angeles; Seattle; Leeds, England. Canadian Division: Delamere & Williams Company, Ltd., Toronto.*

★ PNEUMATIC

Packaging and Bottling Equipment

tration gradient across the film.

By Fick's Law

$$N = \frac{dJ}{dx} D$$

or

$$\frac{dW}{dt} = - D \frac{dJ}{dx}$$

J = concentration of water vapor.
N = molar rate of diffusion.
D = a constant.
W = water vapor in moles.

For any homogeneous film or barrier, the moisture gradient is linearly distributed across the film.

By this statement $\frac{dJ}{dx} = \frac{Q_1 - Q_2}{x}$

And by substitution $- \frac{dW}{dt} = D \frac{Q_1 - Q_2}{x}$

where W is water vapor in moles transferred per square centimeter of surface. The negative sign indicates transfer from the humid to the dry side.

Before leaving the discussion of diffusion we must consider the effect of temperature on water vapor transfer. The effect of temperature has been shown on the rate of adsorption; we shall show later that it has the same effect on the rate of desorption. Its effect on diffusion is to change the value of the diffusion constant, D. All of the literature seems to agree that the effect of temperature on the diffusion is the same as the effect of temperature on the reaction rate constant in chemical kinetics.

The equation is given as

$$D = D_o e^{- \frac{E}{R_3 T}}$$

By taking log of both sides

$$\log D = - \frac{E}{R_3 T} + \log D_o$$

or

$$\log D = - \frac{E}{R_3 T} + K$$

D_o = diffusion constant at infinite temperature.
e = base of natural logs.
E = Energy of permeation in calories per mole.
T = absolute temperature.
R_3 = gas constant in cals per degree per mole.
K = log D.

Desorption — Final Stage

The final stage in moisture vapor transfer to be considered is that of desorption of water vapor from the drier side of the film to the yet drier atmosphere that is adjacent to it.

Consider our equation for the rate of adsorption:

$$\frac{dQ}{dt} = \frac{gP}{(2\pi MT)^{\frac{1}{2}}} \left(1 - \frac{Q}{C}\right)$$

As moisture vapor arrives at the dry side of the film the concentration on the surface of the dry side becomes greater than that in equilibrium with the dry atmosphere. In this event water vapor is desorbed until the film sur-

Route Your Product

Via

THE PACKAGING LINE

--------- THE ----------

BRAND NAMES TRAVEL

The famous brands that travel the U. S. Packaging line represent all types of liquid products, such as pharmaceuticals, wines, liquors, foodstuffs, condiments, household chemicals, waxes, detergents, etc. U. S. Rotary Vacuum Fillers handle practically any type of container finish.

For liquid filling that must be fast, economical and above all, *dependable*, U. S. Rotary Vacuum Fillers add the important plus value of extremely long life. Repeated installations by top plant engineers will justify *your* considerations of this machine. Write for the "Rotary Filler Bulletin."

One of a series of basic models custom-built to user's specific requirements.

U. S. Model B-49 Straightline Vacuum Filler; the most automatic one-man filler. Available with or without discharge conveyor. For all liquids. Changeover for all types containers. Contact parts stainless steel, or plastics. Write for Bulletin B-49.

U. S. Model B-2 Semi-automatic Vacuum Filler. Provides efficient continuous production, filling two containers at a time. Automatic product supply for all containers up to 4½" dia. All liquids and semi-liquids. Portable. Write for Bulletin B-2.

U. S. Siphon Filler. For all liquids, foamy products or products that do not permit agitation. Stainless steel tubes, acid resistant glass lined tank. Write for the Siphon Bulletin.

U. S. BOTTLERS MACHINERY CO.

4009 North Rockwell Street • Chicago 18, Illinois

BOSTON • NEW YORK • PHILADELPHIA • SAN FRANCISCO • LOS ANGELES
PORTLAND, ORE. • DENVER • OGDEN • JACKSON, MISS. • TUCSON • ATLANTA
MONTREAL • TORONTO • VANCOUVER • WINNIPEG • TOLEDO (export).

face is again in equilibrium with the dry atmosphere. In consideration of our equation for rate of adsorption we are really saying that Q becomes greater than C. In this case the expression on the right becomes negative and consequently dQ/dT becomes negative. In other words, water vapor is being desorbed instead of adsorbed.

Thus the equation for desorption is:

$$-\frac{dQ}{dt} = \frac{gP}{(2\pi MT)^{\frac{1}{2}}}\left(1 - \frac{Q}{C}\right) \quad \text{Q is greater than C}$$

It is seen that the same variables govern desorption as govern adsorption.

Equations For Stages

It has been stated that moisture vapor transfer is one continuous activity rather than a staged or discontinuous phenomenon. We should be able in this case to write one complete equation covering the entire process. This is possible but the equation is too long and cumbersome to be of much value. It is best to consider the equation for each stage and to consider the variables that govern the activity of that stage.

Stage one: The rate of adsorption,

$$\frac{dQ_1}{dt} = \frac{gP_1}{(2\pi MT)^{\frac{1}{2}}}\left(1 - \frac{Q_1}{C_1}\right)$$

Integrated and rearranged to give

$$Q_1 = C_1\left(1 - e^{-\frac{gP}{C_1(2\pi MT)^{\frac{1}{2}}}t}\right)$$

Q_1 = concentration humid side.
C_1 = equilibrium concentration humid side.
P_1 = vapor pressure humid atmosphere.

Stage two: Diffusion

$$-\frac{dW}{dt} = D\frac{Q_1 - Q_2}{x}$$

and

$$D = D_o\, e^{-\frac{E}{R_3T}}$$

Stage three: Desorption

$$-\frac{dQ_2}{dt} = \frac{gP_2}{(2\pi MT)^{\frac{1}{2}}}\left(1 - \frac{Q_2}{C_2}\right)$$

Q_2 greater than C_2

Q_2 = concentration dry side.
C_2 = equilibrium concentration dry side.
P_2 = vapor pressure dry atmosphere.

It is readily seen that the complexity of the phenomenon renders the theory very difficult to check. However, in our own laboratory several experiments that have been performed tend to prove the correctness of the theory.

Checking Of Theories

One method of checking arises from the principal difference in this theory and the most commonly accepted

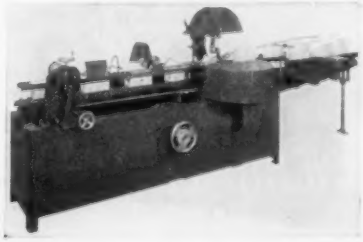
Peters Model SG Carton and Tray Forming and Gluing Machine

produces cartons and trays at speeds up to 175 per minute

At cost-cutting high speeds, the fully-automatic Model SG converts low cost blanks into perfectly shaped glued cartons and trays for packaging many products . . . cookies, crackers, confections, frozen foods, cigarettes, fruits, vegetables and others.

closes up to 150 cartons per minute

Investigate Peters Model CCY Carton Folding and Closing Machine . . . it automatically folds and tucks carton tops to securely close up to 150 cartons per minute.



Write for your copy of the colorful new catalog describing these and other Peters machines.

Peters MACHINERY COMPANY
4702 Ravenswood Avenue
Chicago 40, Illinois • Phone: LOngbeach 1-9000

one in the past. Most past theories have claimed the vapor pressure difference in water vapor across the film to be the driving force for water vapor transfer.

Further, the claim is made that the rate of transfer is linear with water vapor pressure difference. In this presently proposed theory, the water vapor concentration upon the surface is the driving force. This concentration depends more nearly upon relative humidity than it does upon absolute humidity as in the former theories.

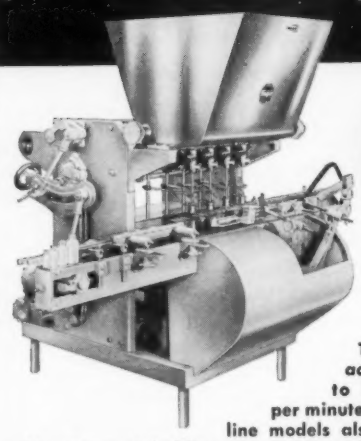
Also, at relative humidity above about 30%, the concentration of water vapor upon the surface has an approximate log relationship with relative humidity. According to our theory the water vapor transfer rate for any given temperature should vary logarithmically with the vapor pressure rather than in a linear manner as in the former theories.

All of our work to this time indicates that our theory is correct. Materials that have been checked are polyethylene and 300 gauge cellophane.

References: Samuel Glasstone, Textbook of Physical Chemistry, D. Van Nostrand Co., Inc, New York; H. Corte and W. Schock, Die Neue Verpackung, Oct. 1955; Paper Trade Journal—various articles; private communications.

Author's comment: Mr. Hilton notes that his study is an outgrowth of committee work done for the National Potato Chip Institute.

Immediate Savings . . . WITH



Hope — Established 1908

TYPE 19A

The 4 line model *accurately* fills 50 to 100 containers per minute . . . 6, 8 and 10 line models also available capable of *accurately* filling up to 250 containers per minute. Hope Type 19S Filling Machines are now in *profitable* use from coast-to-coast filling liquids, semi-liquids or viscous products in jars, plastic bottles or tin cans. For high speed, accurate filling machines look to the leader —

Write for catalog of our complete line

HOPE MACHINE COMPANY

9400-80 STATE ROAD • PHILA. 14, PA.

Circle No. 224 on card

NEW MODEL WITH ADJUSTABLE PACKAGE SIZE

WRAP-ADE

UNIT PACKAGER WITH CONVEYOR FEED

PACKAGES ADJUSTABLE WITHIN RANGE OF 1"x2" up to 6"x12"

This manually fed conveyor is the ideal feeding system for packaging small textile products, flat food items, toys, bandages, or any other reasonably flat small product.

OTHER MODELS AVAILABLE FOR LIQUID, TABLETS POWDERS, etc.

Wrap-Ade Unit Packagers perform an entire cycle of packaging operations including feeding, filling, forming and sealing practically every type of heat sealing materials. Photo Electric registration available.

Send us a sample of your product today for our prompt quotation

PLASTIC ITEMS

HARDWARE

PREMIUMS TOYS

wrap-ade

MACHINE CO., INC.

Manufacturers of Packaging Machinery for over 20 yrs.

83 VALLEY STREET, BELLEVILLE 9, NEW JERSEY

PHONE—PLYMOUTH 9-6150

Good news for users of tape

Here's the latest idea in sealing cartons . . . the DIAL-TAPER. You dial the length of tape and the DIAL-TAPER does the rest automatically . . . measures tape accurately, moistens tape with warm water and cuts off clean.

Users report "up to 50% saving in TIME, 25% saving in TAPE, plus stronger, neater package. Tape sticks tight with one pass of the hands." Used by U. S. Government, Ford, General Electric, all types of business.

For free booklet DT-5 write to Marsh Stencil Machine Company, Belleville 34, Illinois. T-23

Circle No. 225 on card

For more information circle No. 223 on card

The author of this article attended an Eastern university, after which he joined one of the leading pharmaceutical producers in this country. Following his military service during World War II, he joined another well-established pharmaceutical producer in this country and is currently in charge of manufacturing and packaging. He participates in the industry and professional associations of which his company is a member.

Here is a plea for the development of packaging machinery to meet the needs of many a company skipped over in the scramble for automation. The author of this article paints a clear picture of the plight of the small manufacturer plagued with short runs and frequent change-over. He also outlines some suggestions for machinery to meet the needs of such companies.

Let's have some machinery for "problem" packaging

By the man in charge of manufacturing and packaging in a pharmaceutical company

Just how far to mechanize a packaging line is one of the hardest questions a small manufacturer has to answer. Like many other companies our answer to this is complicated by the fact that we have a diversity of container sizes, an astonishing variation of run lengths, and a wide range of products. And because the latest available packaging machinery does not fit our needs, we still do a large amount of manual packaging.

Because of the short runs that are characteristic of our business, perhaps our greatest problem is change-over. Our objection to so much of the available packaging machinery is that the time spent on clean-up and change-over dissipates the advantages otherwise inherent in mechanization. We certainly do not oppose using machinery as far as possible and we should welcome such equipment into our plant. However, the units on the market simply do not meet our needs. We hope this situation changes.

Typical Short Runs

A plant typical of many a small company in our field might have, for example, an order involving 238,000 tablets: These go into just 119 bottles, each containing 2,000 tablets. Another example is a run of 700,000 tablets, involving 350 bottles. For orders like these a small pharmaceutical firm might use 20 or 21 different bottles. Such plants perhaps use seven to ten cap sizes, from 22 to 43 mm.

To summarize this diversity: Any plant like ours might have a run involving just 50 bottles, each receiving 1,000 tablets. Because of the nature of our product, clean-up between runs is a particular problem. For example, in one run we may be packaging dark-colored tablets. The run following it may involve light-colored tablets. Unless we have a thorough clean-up we would find dust and minute particles from the darker tablets showing up on the lighter ones.

With the manual operation clean-up is no problem, but a machine operation would demand a rather meticulous clean-up. Similarly, currently available packaging machinery has intricate parts as well as spots or nooks where tablets might be caught. Also there is the problem of wet tablets, which would affect the operation.

Obviously it is important to avoid mixing tablets of different runs. For example, two tablets of the same color, size, and appearance might differ greatly from a therapeutic standpoint. We must avoid getting these mixed up.

Tablet Variation Problems

In a representative small plant operation, tablets normally reach the packaging room in bulk containers such as fibre drums. Prior to a run a girl counts out 1,000 (or whatever the quantity is) and adds three or four. She then sets her scale for that particular figure, such as 1,003

MARKED IMPROVEMENTS in IDENTIFICATION AND DECORATION

Variety in the shirt business ... *Proving again that there's no single marking method best for every need, a customer of ours uses both labeling and direct marking, and each method is doing a good job. For shirt boxes, he has changed from paper labels to direct imprinting with our 105-10 machines, helping both looks and economy. For washing instructions, style name, etc. on about five million sports shirts a year, however, he has replaced pre-printed or woven labels bought from an outside source with labels printed on our 126C automatic machine. Saves him about $2.00 per thousand labels, and inventory problems and obsolete labels are things of the past. Goes to show what the right method can do, and how we may be able to help you find it.*

A 4000-year-old idea ... *is behind all screen process printing done today, and a brand new Markem machine is no exception. What's different about our idea, however, is the fact that screen printing's peculiar advantages (heavy coverage with fine detail on almost any surface) are now "mechanized" for volume production. The 90S, as we call it, is so new that only a few are "in the field", but we've heard many enthusiastic comments. Those of you who make such things as cosmetic containers, printed circuits, play shoes, instrument dials, plastic bowls, etc. may find the 90S worth looking into.*

The familiar "45" ... *Our "45" machines will probably never enjoy quite the same fame as Mr. Colt's, but they are going great guns. Five years ago this spring we built the first one, and just now serial no. 1100 has been shipped. Nine different models presently comprise the 45 series, and their field stretches from boxes, bags and die cut labels to resistors, condensers and transistors; plumbing fixtures and lollipop sticks to ignition parts and plastic novelties. Markem "45's" can't mark everything (we make about 40 other basic types of machines), but they do illustrate the many jobs a well-designed standard machine can do.*

Markem has devoted 46 years to developing marking machines, elements and compounds—and the best ways to use them. If experience like this can help you, call Markem Machine Co., Keene 35, New Hampshire.

MARKEM

or 1004. On smaller sizes of tablets a plant usually increases its overage.

A useful practice is to make a separate weighing for each drum because of variances arising in the tablet manufacturing operation. After 50 bottles or so, one should check a sample at random. Obviously it pays to take particular care (and hold overage to a minimum) on tablets which are expensive. Plants devote more time to counting and checking where tablets cost $20 a thousand than where they cost $4 a thousand. In the latter instance the excessive labor is not justified.

Another problem is that there are some variations on the tableting machines themselves. Thus, if the tablets are running a little light, you are "giving away" even more than your predetermined overage. This is because you determine your total quantity by weight, and if tablets are running light in weight (although similar in volume) it takes that much extra weight to get a desired count. Incidentally, this difference is not significant therapeutically.

Ideas On Equipment

What we want is a machine that gives an exact count of plain tablets without involving the time used for checking each batch. We think an electronic counter, like that used in the packaging of hardware, nails and the like, would do the job. Our objection to so much of the currently available equipment is that it is not suited to *short* runs — however ideal it may be for long-run, high-volume packaging.

To provide a counting arrangement suitable to our particular situation, there should be a conveyor belt along our packaging table. On top of this moving belt a pair of guides would act as rails, to confine and direct the movement of tablets on the belt. At the end of the belt, and just prior to the filling point, these guides should narrow down to an opening one tablet wide. This opening would readily adjust for whatever width or size of tablet we might handle.

The electronic counter should be located at this single tablet opening. Below the counter would be two filling stations, each with a container in position. As soon as the counter reached its predetermined count, it would actuate a mechanism to flip over to fill the next container. Thus filling and counting would alternate between the two.

The machine attendant would merely keep the filling stations supplied with empty containers and take away the filled ones. The electronic unit would control the fill going into containers.

Because of the effectiveness of today's electronic equipment, it should be possible to have an accurate fill with no overage. We think such a counter could provide a precise figure with no deviation.

At the other end of this belt should be some sort of arrangement for lifting or tipping the drum or other bulk container to provide a steady flow of tablets to the counter. It could be rolled or inverted to provide either a flow or a mere trickle of tablets to the hopper. There could be a conveyor, or it might be necessary to have a girl pull them off. We assume there would be a vibrator on the conveyor to keep a flow of tablets moving toward the single tablet opening.

Various Conveyor Surfaces

Another feature of this equipment would be the use of different materials or substances for the conveyor surfaces. These might be in the form of cut-out sections. Reason for this is that some tablets, for example, mar due to contact with stainless steel — thus necessitating a different material on which the tablets should ride. It would be easy to provide a choice of materials with cut-out sections applicable to the various items handled.

Another alternative would be the use of an inclined table. It might help to slant the conveyor to speed up the movement of tablets on it. Likewise, there should be a vacuum system to remove dust particles and the like from the packaging area, from the belt on which the tablets move, and from the containers themselves.

We suppose there would be an effective way to make the tablets go through the electronic counter in an

upright position. There might be a header on this unit to avoid getting two tablets through (or into the opening) at the same time. This is probably not a problem because we understand that electronic counters are sufficiently sensitive and accurate to detect such variations as double tablets.

We emphasize that we are more or less "thinking out loud" on this development. It is entirely possible others have gone through this same course of thinking and have abandoned the idea for one reason or another that has not yet occurred to us. On the other hand, we are intrigued with its possibilities and hope that some machinery manufacturer takes us up on it. We suppose that many product manufacturers have a situation similar to ours — short runs of varying length, many container sizes, and numerous product differences.

Pinpointing Our Problems

Some comparison of our present manual operation and currently available mechanized operations may emphasize our difficulties: In our plant we cannot use a gravity flow from the floor above. As a result, if we had any machinery it would be necessary to elevate the bulk containers of tablets to the filling hopper. Taking a typical 500-lb. lot containing some 700,000 tablets, the attendant would be constantly up and down the ladder to keep the hopper filled.

This would be a good six feet or more above the floor level. As a result, much time would be involved in reaching for the bucket or receptacle, filling it, climbing the ladder, dumping it into the hopper, climbing down, and returning or putting down the receptacle or bucket. On the other hand, if the flow of tablets takes place from a table height of roughly 30 to 33 inches, this problem does not arise.

Another difficulty is that many of the larger units of machinery currently available are designed for bottles holding 100 tablets each, or similar quantities. As a result, the hopper serving the packaging machinery can hold several hours of work. In the case of an operation such as ours, where much larger quantities of tablets go in each bottle, this situation would not hold true. Further, it would be necessary to have an additional attendant to take away filled containers.

Flexibility Lacking

Present machinery does not have the flexibility that we need. Clean-up and change-over involve so much time that we would lose the advantages accompanying our introduction of machinery. Compare the detailed

Editor's note

The fact that the author of this article wishes to remain anonymous in no way diminishes the value of his observations. He faces a situation that is becoming increasingly common. Probably many companies have built equipment of their own to meet such needs. But what about the company unable to maintain its own machinery design and development facilities? We wonder what ideas the machinery manufacturers themselves have concerning our author's suggestions.

—R.B.H.

..get this
factual story of modern

CHASE

LAMINATED TEXTILE
SHIPPING SACKS

and what they can do for you

(16 fact-packed pages—fully illustrated)

If your products must be protected from moisture, dehydration, or contamination, why not switch to *bags*—you'll save money.

Chase Laminated Textile Shipping Sacks are job-engineered for each individual need . . . easy to fill, close, handle, stack—save space and time for you and your customers, too!

mail this coupon

CHASE BAG COMPANY
309 W. Jackson Blvd., Chicago 6, Ill., Dept. SS-1.

Please send me free 16-page booklet on Laminated Textile Shipping Sacks.

We package _____

Name _____

Company _____

Street _____

City & State _____

Circle No. 227 on card

REDUCE PACKAGING COST

with JIFFY PADDED SHIPPING BAGS

(BUILT-IN-CUSHIONING)

Complete Shipping Units for... { Parts, Tools, Accessories, Soft Goods . . . and other non-fragile products.

★ SAVE OVER 76% PACKING TIME.
★ AS EASY TO USE AS AN ENVELOPE.
★ NO SKILL OR TRAINING REQUIRED.
★ SAVE MATERIAL – LABOR – POSTAGE.
★ MOISTURE RESISTANT – SHOCK ABSORBING.
★ APPROVED BY U. S. POSTAL AUTHORITIES.

Interior Packaging for... { Cushioning and interior suspension of fragile and odd shaped objects.

★ ALL AROUND PROTECTION – top, bottom, sides, front and back.
★ PREVENT SHIFTING AND BREAKAGE.
★ REPLACE BOXES, FILLERS, DUNNAGE, DIVIDERS.
★ SAVE SPACE.
★ REDUCE PACKAGING COSTS.

- 10 Standard Sizes—ranging from 4" x 8" to 14¼" x 20".
- One or Multi-colored printing.
- Stock bags made of special 60 lb. kraft—highest burst and strength characteristics.
- Colored krafts and re-inforced papers available.

Our packaging engineers will gladly assist you in solving your specific packaging problem. Your request for samples for test shipment will receive our immediate attention.

Jiffy

JIFFY MANUFACTURING CO.
387 FLORENCE AVENUE
HILLSIDE, N. J.

clean-up of contemporary packaging machinery to our present operation: At the end of a run a girl merely wipes off her scale, wipes out the funnel, and she is ready for the next run. In our normal sequence, one girl weighs, counts, and fills each container. The next girl does the cottoning manually — preparatory to putting on the cap.

Incidentally, we have seen no automatic cottoning unit that would lend itself to our types of short runs. Therefore, even with the electronic counter we have suggested, we would have no additional mechanization on our line — unless someone shows up with an adjustable cottoner capable of *quickly* meeting the variations in the necks and dimensions of different bottles.

If we had the proper counting equipment, we would thus preserve the advantages of flexibility and simplicity inherent in our manual operation and still get the benefits of automatic counting. One of our objections to machinery is that it takes up space all out of proportion to the value it would give us — in the light of our short-run situation. Unless the machinery is permanently mounted, it has to be on wheels. Even then it would be hard to move it around in our plant. Incidentally, our electronic counter would have no special power or position problem, and could operate with 110-volt or other normal electric power.

Eliminating Package Checks

A feature of our current operation is the necessity of having four different quality and quantity checks for a typical run. Since each of these checks requires five to six minutes, the use of an accurate, electronic counter would make them unnecessary — thus saving us that time for each run.

Our change-over for container size would be minimized because the device we are proposing should be equipped with means of elevating or lowering the belts within such a range as ten inches. This would permit quick and accurate compensation for bottle and jar size variations.

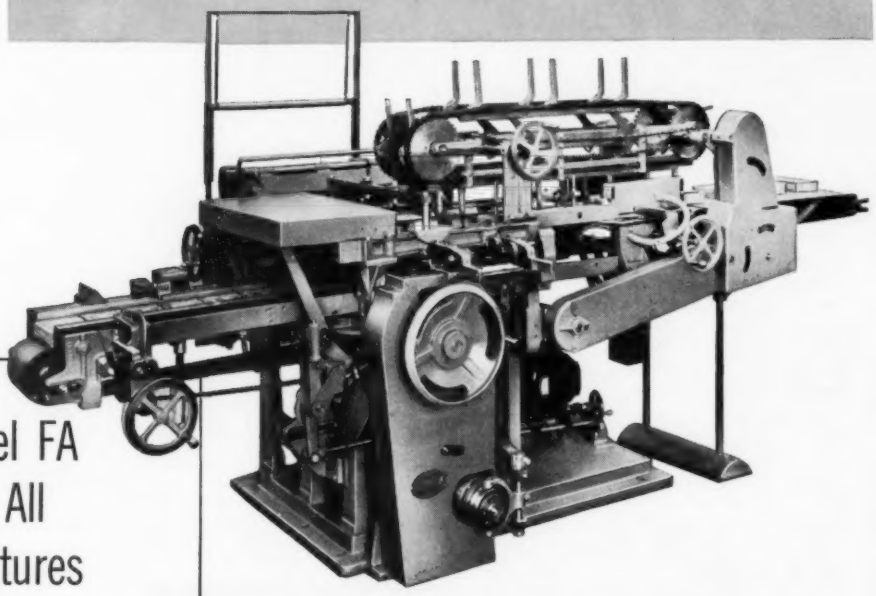
In proposing these ideas we emphasize that we have not considered them in a vacuum. We have reviewed all types of available machinery, have visited many packaging shows, and have kept abreast of current developments. Perhaps there are good reasons why no one has offered the particular equipment we are proposing. However, we think we understand the equipment needs of our operation, and feel that such equipment should serve our purpose. We rather think that other manufacturers faced with small runs would feel likewise.

Wanted — an electric counter

1. It should automatically count tablets and control a predetermined fill by count.
2. It should fit right into an existing manual packaging table or line.
3. The whole operation should use gravity for the dumping or sliding of tablets — to give the counter a steady flow of product.
4. It should permit the easy and quick adjustment of belts or guides for different jar and bottle sizes.
5. It should be simple, inexpensive, and portable.

GET MAXIMUM VERSATILITY

With 100-a-Minute Wrapping Speeds



Only Model FA Gives You All These Features

Feed: Continuous chain infeed, or intermittent chain infeed to handle stacks of flat items.

End Folds: Double-point end fold is standard; reverse double-point fold, single or double-point turned-under fold, crimp seal and special folding for extension edge boxes also available.

Materials: FA glues or heat seals. It can handle waxed, sulphite or kraft paper, cellophane, glassine and reinforced foils, as well as mylar.

Paper Feed: Both roll and sheet feed available.

Attachments: Easy-opening tape, medallion and code dater attachments available.

Here's the machine that will help cut your costs with top production every day. In the Model FA, you get speeds up to 100 packages a minute, combined with the most versatile operation you can find. You're assured of better wraps, too, for packages pass through the FA in a straight line, and operations are performed without turning. Improved electric eye registration gives you the *most accurate* panel registration possible, and an automatic paper stop controls feeding.

Size ranges on the Model FA run from 2" to 11½" L, 1⅛" to 5⅝" W, ⅛" to 3½" H. Models FA-2, -3 and -4 handle larger packages. You can get full information on the many FA features by contacting our nearest office.

PACKAGE MACHINERY COMPANY

EAST LONGMEADOW, MASSACHUSETTS

NEW YORK • PHILADELPHIA • BOSTON • CLEVELAND
CHICAGO • ATLANTA • DALLAS • DENVER
LOS ANGELES • SAN FRANCISCO • SEATTLE • TORONTO

For more information circle No. 229 on Reader Service Card

Announcements of machinery and products

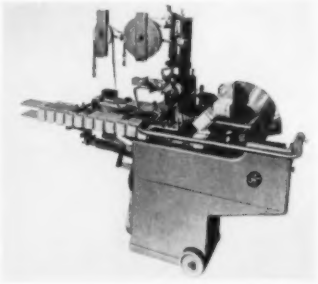
1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
2. Now, *circle* the corresponding numbers on the postcard, located inside back cover.
3. Next, *fill* in your name and address.
4. Then, *mail* the card — we pay the postage.

Vinyl Film Adhesives

National Adhesives Div., National Starch Products Inc., announces three adhesives for combining vinyl chloride films, based on a new copolymer. One is a general purpose fluid emulsion for adhering vinyl film to cloth, paper, and paperboard, and contains approximately 54% solids with a viscosity of 1000-1500 cps. Another is similar, but has a viscosity of 5000 cps and is designed for the lamination of vinyl film to latex saturated paper. The third is tailored for the wet combining of vinyl chloride to paperboard and wood, contains approximately 49% solids, and has a viscosity of 1000 cps. National says the first two give best results if coating is applied to the vinyl film and then the combined surfaces are dried at 160 degrees F. The latter can be dried at room temperature, after wet combining. Circle No. 1.

Bundling Machine

Potdevin International Ltd. announces availability of the Jagenberg-Werke bundling machine, which handles a



wide range of sizes by simply changing dial settings. It bundles such products as cartons, books, envelopes, labels, cardboard, papers, etc., at a rate of 25 bundles per minute. The machine applies a strip of plain paper completely around the bundle. A short piece of gummed tape seals the two ends of the strip. Operation is automatic except for feeding. The machine is self-contained and on wheels. Size ranges of bundles are: length, 2¾" to 11", width, 1⅜" to 6¾", height, 2" to 3½". Circle No. 2.

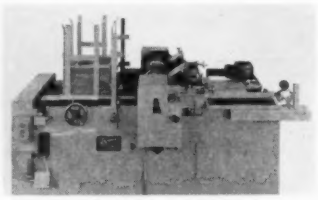
Vibrating Bag Flattener

Carrier Conveyor Corp. has a new vibrating bag flattener designed to flatten bottom-heavy bags of loose, bulk

material. Carrier says it is adapted to fragile materials such as pellets, flakes, briquets, and prilled or spray-dried materials. Available in standard models, either fixed or portable, the machines work on the natural-frequency principle, gently tossing the bags upward and forward. Since the material inside the bag conveys more quickly than the bag itself, flattening is achieved almost immediately, Carrier notes. There are no belts to adjust or replace. Circle No. 3.

Flat Box Printer

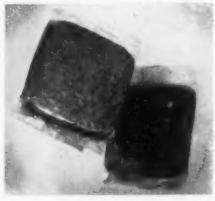
Algene Marking Equipment Co. announces an automatic box printing machine designed for in-plant operation, which features utilization of a hopper feed attachment. Depending upon sizes of the boxes, the machine can handle up to 3000 cartons per hour. It can be made to mark one panel, to the inculsion of every panel, flap and side of a flat box. Algene says it will produce each machine to



suit the particular user's printing requirements, and the accommodation of its ranges of box sizes. Circle No. 4.

Film For Air-Sensitive Items

The Dobeckmun Co. reports a new transparent material, Durafilm MS, composed of 50 gauge Mylar coated with



saran, with polyethylene extruded on the saran coating. The film is designed for packaging all types of air-sensitive products, such as luncheon meats and cheese. Dobeckmun says tests confirmed that discoloration in luncheon meats is caused by the oxidation of color pigments developed during the meat curing process, since when there is oxygen present inside the package, color fading develops when meat is exposed to light. The company says all types of luncheon meats, even spiced meats, won't discolor in the

presence of light and no air-borne bacteria can develop inside the package when vacuum packaged in this film. Circle No. 5.

Box Stapling Unit

Container Stapling Corp. announces its Model CSI unit for stapling the bottoms of filled containers from the

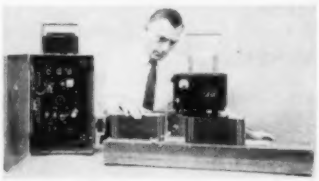
outside after they have been packed. An inverted head stapler, it is air-operated with fully pneumatic controls. The machine will drive up to 200 staples per minute, depending upon operator. Only connection necessary is to a supply of compressed air at a minimum of 60 psi. All wearing surfaces of stapling head are hard chrome plated. Circle No. 6.

Heat Sealer

Product Packaging Engineering has a new semi-automatic heat sealing machine, Model 54UL, that seals unsupported plastic films such as vinyl and polyethylene, as well as most coated and laminated barrier materials. It utilizes a heated platen in conjunction with a Teflon-Fibreglass clamping pad. Heated platen is designed to extend insulation life. Product Packaging says the model has pre-set dials for heating and dwell cycles, eliminating the possibility of operator error, and a two-tube electronic timer controls an electro-mechanical lock that holds jaws of pressure platen in position once the foot pedal is depressed. Overall width of sealing platen is 14", jaw opening is ¾". Circle No. 7.

Electronic Inspection Unit

Photobell Sales Corp. announces its new Photobell package inspector which inspects for product uniformity, such

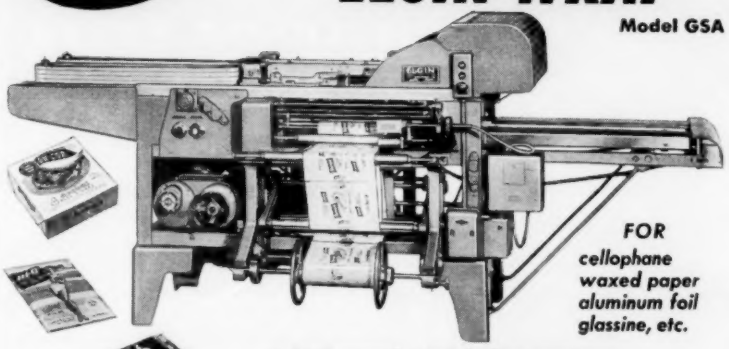


as for full weight or for inclusion of

Elgin EARNS ITS WAY

"60-A-MINUTE" ELGIN-WRAP

Model GSA



FOR cellophane waxed paper aluminum foil glassine, etc.

★ high-speed, straight-line producer
★ fully adjustable for package variety
★ rapid changeover adjustments

Fully automatic, the great Elgin-Wrap is built to be a steady, swift and easily maintained producer! Designed to handle heat-sealing materials, it can also be equipped with photo-electric registration controls for printed wrappers. And the Elgin-Wrap is unequalled in its price field for speed.

Write for folder Dept. E72 or Send samples for quotations and recommendations on your needs.

A DIVISION OF
ELGIN MANUFACTURING COMPANY
200 Brook Street • Elgin, Illinois

For more information circle No. 230 on Reader Service Card

Stuck with a sticking problem?

use...

SLIPICONE

heat-stable silicone release agent

Speeds packaging and labeling—keeps films, waxes, adhesives and other packaging materials from sticking to heat-sealing equipment.

Reduces maintenance and cleaning costs—keeps equipment clean and sanitary . . . prevents pile-up, browning and ink-smear.

Available in Compound or Spray—for quick, efficient application to all types of packaging and labeling equipment. *Compound*—2 and 8 oz. tubes; 10 lb. cans. *Spray*—12 oz. aerosol bombs.

Save money with Slipicone. Write today for list of distributors.

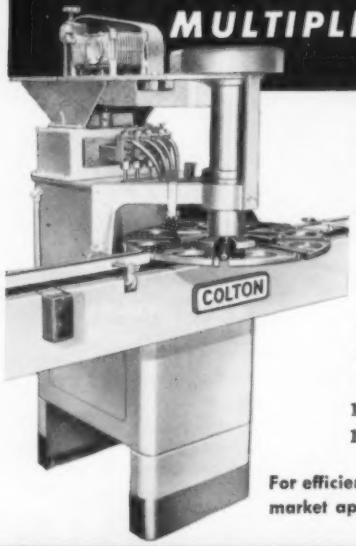
DOW CORNING SILICONES

Address Dept. 5214a
DOW CORNING CORPORATION
MIDLAND, MICHIGAN

ATLANTA • BOSTON • CHICAGO • CLEVELAND • DALLAS
DETROIT • LOS ANGELES • NEW YORK • WASHINGTON, D.C.
(Silver Springs, Md.)

For more information circle No. 231 on Reader Service Card

WORLD'S FASTEST, MOST ACCURATE, MOST VERSATILE MULTIPLE LIQUID FILLER



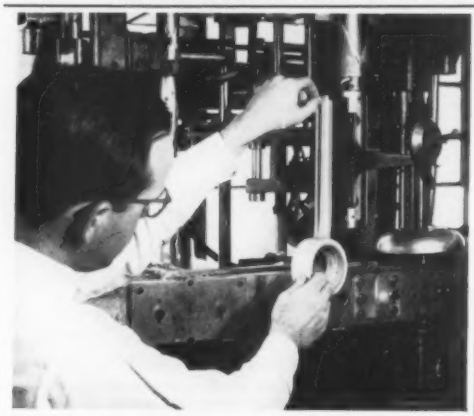
1. Up to 480 containers a minute
2. Accurate to less than 1%
3. Fills any liquid, alcohol to cream oil
4. Completely adjustable in *every* respect
5. Patented dripless suck-back, adjustable to viscosity
6. Nozzles adjustable for container height and width
7. Simple air bleeder
8. No container—no fill
9. Special adaptations available
10. Quick disassembly for sterilizing
11. Completely automatic

For efficiency, performance, economy, nothing on the market approaches this Colton No. 124-126-128-132.

ARTHUR **COLTON** COMPANY
DIV. SNYDER TOOL & ENGINEERING COMPANY

Phone your inquiries collect to LOrain 7-0123.
3543 E. LAFAYETTE
DETROIT 7, MICHIGAN

For more information circle No. 232 on Reader Service Card



With TEMP-R-TAPE®
Apply a TEFLON surface in seconds . . . end sticking and build-up

Teflon's non-stick surface is now available in an easy-to-use adhesive tape called Temp-R-Tape. On heat sealing bars, flat plates or wherever a slippery surface is needed, Temp-R-Tape ends sticking and build-up. Temp-R-Tape is odorless, tasteless, non-contaminating, has −100°F to 400°F range. ¼" to 12" wide, .006" or .013" thick. Recommended by machinery and film producers!

***Many different* uses for Temp-R-Tape in packaging.**

ON HEAT SEALING BARS
ends sticking and spoilage, replaces in seconds, cuts down time.

ON FORMING PLATES
reduces static electricity and wear.

ON FORMING DIES AND BARS
cuts lint and glue build-up.

ON GUIDE RAILS
ends scratching, quiets operation.

MANY OTHER USES
send for folder and sample.

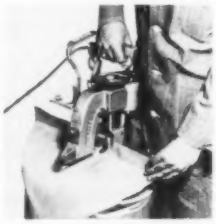
FREE SAMPLE *and folder . . . write, phone or use inquiry service.*

A PRODUCT OF CHR THE CONNECTICUT HARD RUBBER CO., NEW HAVEN 9, CONN.

all component parts. This machine is based on the use of high-frequency current passing through entire package. This high-frequency current will usually permeate right through the package itself, measuring the quantity of most materials by allowing current to flow in proportion to the amount of material present, according to Photobell. Any package containing materials that can affect the flow of high-frequency current may be examined and sorted. Items which cannot be checked are those such as metal containers closed on all sides, non-uniform packages such as bananas and fruit, and randomly distributed packages, such as bags of hardware. The machine can also inspect for such qualities as moisture content, Photobell notes. Circle No. 8.

Portable Bag Closer

The Dave Fischbein Co. reports a new portable bag closer which closes from the lightest to the heaviest textile or



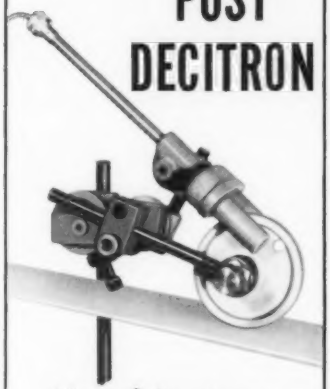
paper bag, whether asphalt treated or specially processed, with no change in parts or adjustment. The machine is electrically powered by a 1/12 hp motor and weighs 10½ lbs., including full cone of thread. It sews 40 feet a minute. Light enough to carry with one hand, the operator merely guiding the machine, it can also be adapted for stationary use. A suspension unit is provided and a counter-weight holds the machine at any desired height. Circle No. 9.

Skin Packaging Unit

Skin-Pack, Inc. has a new model of its skin packaging machinery, which includes such operational improvements as automatic timers for controlling all heat cycles; primary and secondary heat, vacuum forming, over-dwell and vacuum release. Skin-Pack says twin loading tables on either side of the ovens, which permit two simultaneous packaging operations, are more accessible. The unit is available in several sizes and can handle specially processed board up to 60" by 90". In the skin packaging operation, the product acts as its own mold. Circle No. 10.

MODEL LF-1

POST DECITRON



Lineal Footage Counter

Connected to any Post DECITRON electronic counter, the lineal footage device provides accurate measurement of paper, wire, rope, sheeted products, etc.

If desired, a predetermined length can be "set" into a Post preset counter and when the lineal footage device reaches this length, a secondary circuit (i.e. a slitter or marker) can be activated.

Dependable, accurate, maintenance free. Varied "beam hole", or wheel size will permit fractional footage counting, if desired. Write for bulletin LF-1.

Decitron Electronics Products Division

POST

POST MACHINERY COMPANY

Beverly, Mass.

Circle No. 234 on card

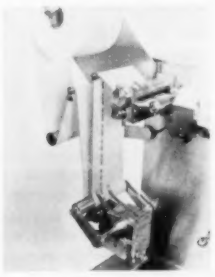
Drum Liner Filling Spout

Protective Lining Corp. reports a new filling spout, which is built into drum liners of film made from Bakelite poly-

ethylene to prevent airborne contaminants from coming in contact with plastic resins. The film liner is about 48" in length and is cut from an extruded tube of polyethylene that is 78" in circumference. A circle of polyethylene film is sealed to one of the open ends of the tube to provide a round bottom. Before the other end of the liner is double-sealed in a straight line, a smaller polyethylene tube is inserted at one corner and sealed to form a filling spout. The 8" spout is easily tied off with a knot before it is removed from the filling nozzle. Circle No. 11.

Imprinter For Wraps

Adolph Gottscho, Inc. announces a miniature flexographic printing unit that imprints flavors and brand names



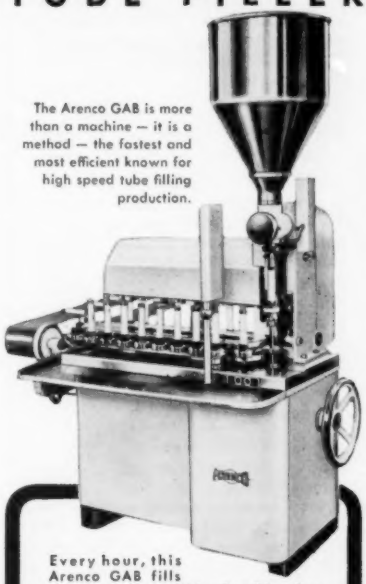
on ice cream brick wraps during the packaging operation. The unit, Rolaprinter Model 992, imprints the paper wrap as it is fed from the roll just prior to being cut and wrapped around the brick. It uses rubber type and quick-drying liquid inks of any color, and holds an ink supply adequate for a day or more of continuous imprinting operation. Refilling of the ink reservoir is done by pouring it in when needed. Circle No. 12.

Preferred

FOR PRECISION AND PERFORMANCE

THE ARENCO g.a.b. TUBE FILLER

The Arenco GAB is more than a machine — it is a method — the fastest and most efficient known for high speed tube filling production.



Every hour, this Arenco GAB fills and closes up to 3,000 collapsible tubes, depending on material. It positions, tightens cap, codes and discharges to conveyor line. All the operator does is load!

OTHER FEATURES INCLUDE:

Product viscosity maintained
Positively clean tubes
Quick change of product or tube size
All parts accessible for easy sterilization
Fully adjustable for volume variation
No-tube, no-fill
Adaptable to almost any type of closure

Advanced engineering and production know-how makes Arenco a truly modern filling machine — available at a practical cost. Facts that tell the complete story are yours for the asking. Write for them today!

ARENCO

MACHINE COMPANY, INCORPORATED
25 West 43rd Street • New York 36, N. Y.

Circle No. 235 on card

Industry literature available free

1. Beneath each announcement is a code number. As you select items on which you want more information, *note* this number.
2. Now, *circle* the corresponding numbers on the postcard, located inside back cover.
3. Next, *fill* in your name and address.
4. Then, *mail* the card — we pay the postage.

Checkweighing Equipment

The Exact Weight Scale Co. offers a data sheet on its Model 1200 Selectrol checkweigher, which weighs, classifies, and sorts products into, over, under, and correct weight groups. This unit has a speed of up to 100 weighments and classifications per minute, and can handle packages weighing up to 5 lbs. Circle No. 101.

Double-Coated Tapes

Dutch Brand Division, Johns-Manville, describes its two double coated tapes in an illustrated four-page brochure. These tapes, which have adhesive on both sides, are used in place of tacks, clamps, glue or cements in many operations. The brochure gives applications, technical data, characteristics, and performance specifications for both paper and cloth backed tapes. Circle No. 102.

Volumetric Filler

John R. Nalbach Engineering Co., Inc. provides a description of its rotary volumetric filling machines for free-flowing powders and granulated materials in a data sheet. These fillers handle a large variety of sizes from 100 to 300 containers per minute, and have a drive motor from ¾ to 1½ hp, depending on products handled. Circle No. 103.

Vacuum Trimming Machine

Vacuum Forming Corporation offers an illustrated brochure which describes the three-in-one operation (vacuum forming, drape and plug forming, and automatic trimming of thermoplastic sheets) of the VacTrim machine. This new machine turns out a wide variety of plastic products, including ice cream containers, small flower pots, and coffee cups, and has a maximum mold size of 24" by 24" and a 9" depth of draw. Circle No. 104.

Techniques Of Wrapping

Waxed Paper Merchandising Council, Inc., provides a how-to-do-it technical manual for bakers and wrapping machine operators, "How to Solve Your Bread Wrapping Problem." This 20-page manual deals with the proper handling and storage of waxed paper, installation and maintenance of wrapping machine, and correct operation of the machine. Circle No. 105.

Automatic Packaging

Bartelt Engineering Co. describes its latest developments in unit packaging in a new folder on packaging automation. The folder illustrates operation of the company's complete packaging line, including a new cartoner. Various packages that are made on these machines are also shown. Circle No. 106.

Humidity Detection

El-Tronics, Inc. offers a four-page folder illustrating and explaining its electrical humidity detecting system. This system, the company says, determines moisture conditions in sealed packages without breaking seals or packages, applicable for military and industrial packing. The meter is calibrated to indicate relative humidity of 5% to 50%. Circle No. 107.

Viscous Product Filler

Hope Machine Co. describes its Type 15 MS machine in a booklet. This is a single valve, semi-automatic, viscous product piston filler. It fills containers of ¾ oz. to 32 oz. capacity and from ¼ pt. to 1 qt. in one piston stroke. Speeds range from 12 to 25 strokes/min. Circle No. 108.

Collapsible Tube Fillers

Arthur Colton Co. provides specifications and pictures for twelve different models of its line of collapsible tube filling, closing, and crimping machines in an eight-page catalog. Circle No. 109.

Package Makers And Wrappers

Battle Creek Packaging Machines, Inc. 16-page brochure pictures and describes 26 different wrapping machines and package makers for bakery products. Circle No. 110.

Bottle Neck Banding

Economic Machinery Co. Bulletin BA-265 gives floor plans and specifications for its automatic banding machine which applies cellulose neck bands to bottles in a speed range of 35 to 525 bottles/min. The unit handles a wide variety of bottle shapes 1½" to 12¾" high, and ½" to 3¾" in diameter. Band sizes: 12 to 65 mm. long, and 12 to 38 mm. cap diameter. Circle No. 111.

Automatic Candy Wrapper

Supermatic Packaging Corp. has a new bulletin on the "Supermatic 5000." The machine automatically fold-wraps single square candies, groups them into packets of 5, 10, or 15, then wraps the packet with three-sided heat seals. This unit makes up to 400 single square wraps/min., using any type roll fed wrapping material. Circle No. 112.

Carton Filling And Sealing

Clybourn Machine Corp. describes its Model C continuous automatic carton filling and sealing machine in Bulletin No. 21. The machine packages granulars, powders, bagged products, and long cut products, such as spaghetti and macaroni. Speeds range up to 60 cartons/min. Five models handle carton sizes ranging from 3" high, 2" wide, ¾" thick to 14" high, 10" wide, 5" thick. Circle No. 113.

New Packaging Machinery Bulletin

Pneumatic Scale Corp., Ltd. Bulletin 133 gives pictures and specifications for 15 different models of automatic packaging machinery, designed to run at speeds up to 300 containers/min. It includes machines for packaging free-flow products, and also lists bottling equipment for air cleaning, gravity or vacuum filling, rotary capping and labeling of bottles, cans and jars. Circle No. 114.

Extra Short Case Sealer

Elliott Mfg. Co. Brochure No. 105 describes a low cost short case sealer. Machine is 8' long and 36½" wide. It automatically glues and seals top and bottom flaps, or top flaps only, at average speed of 200 cases/min. Other models are available for greater speeds, and a wide range of case sizes. Circle No. 115.

Cellophane Shipment Data

The Film Division of American Viscose Corp. Bulletin No. 3320 provides a table showing the standard pallet sizes, and their weights, used in shipping various roll and sheet sizes of Avisco cellophane. Suggested cellophane storage methods are also included. Circle No. 116.

Versatile Wrapper

Miller Wrapping and Sealing Machine Co. describes its Model MPS wrapping machine in a current information sheet. It wraps boxes or open trays of foods, textiles, drugs, stationery, etc., using roll or sheet fed wrapping materials. It heat seals or glue seals with cold glue. Speeds range up to 21 packages per min. Package sizes handled are 2½" to 15" long, 1" to 9" wide, ½" to 5" high. Circle No. 117.

Polyethylene Resins

The Polychemicals Dept. of the Du Pont Co. offers Bulletin A-2163. It lists 13 different grades of polyethylene resins engineered for specific packaging needs. Included is a comparison chart showing the melt index, density, molecular weight distribution, properties and packaging applications for each type of resin. Circle No. 118.

Silicones

Dow Corning Corp. has a four-page data sheet listing the physical properties and applications of Dow Corning 1107 colorless silicone product. When applied to paper or parchment, it minimizes adhesion of sticky materials, such as medicinals and bakery products. As a bottle and vial coating it improves the drainage of costly liquids. Circle No. 119.

Package Caser

The Canning Machinery Div. of Food Machinery & Chemical Corp. offers a four-page bulletin, No. CMD 601-W. It lists specifications and pictures of the "Sure-Way Package Caser." This machine can load rigid or semi-rigid packages into a variety of corrugated case sizes, either top or end loading, at speeds up to 240 packages per min. Circle No. 120.

Automatic Carton Filling

Wright Machinery Co. describes its automatic cartoning system in a current brochure. It forms carton, fills and weighs free flowing products, and closes carton. Carton sizes handled: 2½" to 4¼" wide, 1" to 2¼" deep, 5" to 9" high. Net weight range: 4 oz. to 16 oz. Operating speed: 24 to 30/min. Circle No. 121.

Case Loading

J. L. Ferguson Co. has published a four-page article, "New Techniques In End Loading Cases." It thoroughly discusses the economic and structural advantages of end opening corrugated cases, and the methods used in loading them with round, square or rectangular packages. Circle No. 122.

Dry Product Fillers

Stokes & Smith Co. bulletin P-803 lists eight different filling machines for handling pastes, powders and granulars. This is a complete line of duplex and tandem filling stations, with weighers, conveyors and automatic cap presses. Circle No. 123.

Vacuum/Gas Pouch Packaging

Flex-Vac Div., Standard Packaging Corp., offers a four-page bulletin on the new Model 6-12 vacuum or gas pouch packaging machine. Fully automatic, this unit handles luncheon meats, ham, cheese, dried beef, frozen foods, etc., at speeds up to 60/min. Circle No. 124.

Electric Tape Dispenser

Ideal Stencil Machine Co. bulletin explains features of the "Clip-A-Tape." This is an electric gummed tape dispensing machine that utilizes a numbered keyboard which selects varying tape lengths from 3" to 100". It measures, moistens, delivers and cuts gummed tape ready for sealing. The unit handles tape widths from 1" to 4". Circle No. 125.

Roll-Through Labelers

Chisholm-Ryder Co. of Pa. eight-page catalog gives complete data on six models of New Way Labelers. These are "roll-through" labeling machines designed to affix labels to cylindrical containers of glass, metal, or fibreboard. Moderate speed and high speed units are described. Circle No. 126.

Case Stapler

International Staple & Machine Co. four-page brochure explains details of the "Dual Stapler." This machine simultaneously staples the tops and bottoms of many types of shipping cases, after they have been filled. Case sizes handled range from 5" to 24" wide and 5" to 36" high. Circle No. 127.

(Continued on Page 46)

SENTINEL*
PACEMAKER

The Sentinel Pacemaker, made by pioneers in heat sealing, is a thermal impulse sealing method, designed and engineered to give you these advantages:

- Light Weight, compactness, low cost
- Requires no skill
- Insures a safe, FAST and positive seal with ease
- Precision automatic controls for correct pressure, heat dwell time and COOLING dwell time
- Seals varied thicknesses of Polyethelene, Saran, Pliofilm, MYLAR, Acetate and Vinyl, etc
- No fussy installation. Just plug in and start sealing
- Economical — draws current only during seconds when heating element is energized
- Simple, rugged, no service troubles
- Will soon pay for itself in faster production, improved seals

Sizes: 9, 13, 25 and 45 inches sealing area. Hand or foot operated.

For heavy-duty, large dimension jobs, the Sentinel High Speed Band Rotary Sealer — (Continuous Motion) and the Sentinel Jaw Type Sealer. Sentinel equipment meets U. S. Military Specifications.

Write for detailed literature

PACKAGING INDUSTRIES
151 Pine Street Montclair, N. J.

*Trademark

Please rush me detailed literature on PE
☐ Pacemaker Sealer ☐ Jaw Type
☐ High Speed Band Rotary
Name_____
Company name_____
Address_____
City_____ State_____

Circle No. 236 on card

Cappers and Sealers

Resina Automatic Machinery Co., Inc. gate-fold brochure shows ten different models of its line of bottle and jar cappers and edible oil can sealers. Semi-automatic and fully automatic models are described. Speeds range from 20 to 200/min. Circle No. 128.

Cartoning And Overwrapping

F. B. Redington Co. has a comprehensive 40-page catalog illustrating and describing 18 different types of standard cartoning equipment, as well as many special machines for tablet counting and filling, banding, envelope filling, etc. Semi-automatic and fully automatic cartoners are listed with optional cellophane overwrapping machines. Complete packaging systems are available which set up cartons, load and overwrap them. A wide range of products are packaged on these machines, including specialty foods, drugs, soaps, paper napkins, crackers, roll bandages, and film, etc. Circle No. 129.

Case Opener and Positioner

A-B-C Packaging Machine Corp. provides a data sheet on its case opener and positioner. This machine automatically opens corrugated cases, folds the lower flaps, and places the cases in position for loading. Circle No. 130.

Contour Packaging

Abbott Plastic Machine Corp. brochure describes the operation of the "Skin-Pak" machine in contour sealing non-food products with plastic film to cardboard backing. Specifications are given for nine different models. Circle No. 131.

Round Container Labeling

Paisley Products, Inc. offers Technical Service Bulletin No. 16 which reviews spot labeling and wrap-around labeling methods. It also describes the commercially available machines used with these techniques and lists applicable adhesives. Circle No. 132.

Parts and Hardware Packaging

Packmaster Sales Co. has a brochure describing three models of the "Packmaster." An automatic machine, it loads and heat seals packets with odd shaped products such as parts, hardware, etc., in a variety of military and industrial packaging flexible materials. Speeds range up to 80/min. Circle No. 133.

Test your Aerosols!

Automatically in
ISLAND'S new HEAT and LEAK TEST TANK

Stainless steel Rex Table-Top chain, available in various widths for single or double lines of cans . . . and the cans are prevented from slipping on the incline and decline by magnets attached to the chain track. The tank itself may be constructed in hot dipped galvanized or stainless steel, and the unit serves as both a heat and leak test tank.

Write for detailed bulletin

ISLAND EQUIPMENT CORP.
27-01 Bridge Plaza North, Long Island City 1, N. Y.

Problems of short run packaging line operations

(Continued from Page 26)

to buy a surplus than to run short and face a second run.

Test Filler In Advance

It is helpful to make preliminary filler tests with the actual ingredients which are to be used in the full scale run. Too frequently the development department prepares initial samples from laboratory ingredients either produced on pilot equipment or secured from sources other than those which will provide the ultimate materials. It is not unusual to discover vastly different performance characteristics when the production batch is finally delivered from the mixing division to the packaging division.

If possible, cycle the filler on this final material for at least half an hour, checking density and uniformity of weights as you go. It is easier to correct a faulty setup at this point than after it is tied in with the balance of the line.

Lack of efficiency of personnel, while by no means totally avoidable, can be somewhat limited by some instruction in their specific duties with a sort of "dry run" to establish an economy of motions and familiarity with the general requirements of the job. In this regard, it may be well for the setup men to run the job for about an hour some time before actual production is undertaken. During this time they have a fair opportunity to pick out the biggest bugs in the operation.

This "hour" may very well stretch into eight or ten but even so headaches are saved later on and it is time well spent. It would be well if during this time the machine operator who is to run the job were on hand to observe the job characteristics and machine adjustments. The finished merchandise so produced and held in bulk can later be used for the "dry run" training for the rest of the assemblers on the line.

Be Candid About Costs

The problem of losses resulting from improvised machine parts is one of the inevitable inadequacies of short run producing. If the budget won't allow for a capital investment in parts, or the schedule won't allow the extra time in which to have them fabricated, you will simply be obliged to work at increased operational costs instead. There is no simple remedy to this problem, but be realistic in reporting running costs to the accounting department.

It may be relatively simple to "lose" some of the actual costs to avoid making the production department look too bad. But remember, however stupid you may feel when one or more of the many "simple things" goes wrong with your short run, you are not alone. You are in fact a member of a rather distinguished company of long suffering shortrunners.

It is even possible that when the real costs of these ventures become apparent, there may be considerably more thought given to the related problems than is now frequently the case where emphasis is placed primarily upon design, customer preference (a black magic term), and media scheduling, leaving only an afterthought for the actual problems of producing the stuff.

Too often the smug expectancy

that "our machines produce at the rate of 90 per minute" is carelessly applied to the costing of short runs with an "adjustment factor" to allow for slow starting. In all realism this adjustment factor is too often a hazard to clear thinking rather than an aid, for it is hard to realize that adjustments, instead of running at some nominal percentages, may run many times higher. Instead of dropping from 90 to a hoped-for average of 60 per minute, the short run, frankly viewed, may have come closer to 15 or 20 per minute average when all the time is tallied.

Keep Your Perspective

In case all of this should sound too gruesome costwise, bear in mind that it is too easy to lose perspective in thinking in terms of "per unit costs". The one lonely virtue of a short run is inherent in its name: It is short. Hence the per unit factor is not multiplied too many times and the real total cost is not too large.

When the accounting department groans over a couple of thousand dollars of expenditures only too easily traceable to your department, remind them of the costs that went into the layout, artwork, and media space for the introductory sales program. Remind them also of the cost in consumer sales of just a few serious mistakes which could easily have occurred had the short run been made with too much of an eye to economy.

In conclusion remember that the relationship between the long and short run is similar to that between a habit and an unusual occurrence; the handling of the short run, like the disposition of an unusual incident, can scarcely be accomplished by a well oiled set of reflexes or pattern reactions, but instead it requires close attention, analysis and rational judgment at each step of the way.

A little more time spent in planning, setting up and personal watching will usually pay rich rewards. And, even though you may not be able to avoid all of the hazards of short runitis, take comfort in the knowledge that, like the common cold, from time to time everyone else is exposed to them too.

Index of Advertisers

Arenco Machine Co., Inc. 43
Battle Creek Packaging Machines, Inc. 25
Chase Bag Company 37
The Cleveland Container Company 24
Arthur Colton Co. 42
The Connecticut Hard Rubber Co. 42
Crossett Paper Mills 8
Crown Cork & Seal Company, Inc. 10
Dobeckmun Co. 5
Dow Corning Corporation 41
Economic Machinery Company ..... inside back cover
Elgin Manufacturing Co. 41
J. L. Ferguson Co. 6
The Filler Machine Co., Inc. 30
Food Machinery and Chemical Corp. 27
The Goodyear Tire & Rubber Co. 1
Hinde & Dauch 12
Hope Machine Company 34
Island Equipment Corp. 46
Jiffy Manufacturing Co. 38
Johns-Manville, Dutch Brand Div. 3
R. A. Jones & Co., Inc. ..... outside back cover
Markem Machine Company 36
Marsh Stencil Machine Co. 34
Mid-States Steel & Wire Co. 29
Minnesota Mining & Mfg. Co. 9
Package Machinery Co. 39
Packaging Industries 45
Paterson Parchment Paper Co. 26
Peters Machinery Company 33
The Pfaudler Co. 11
Pneumatic Scale Corp., Ltd. 31
Post Machinery Co. 43
Potter & Johnston 7
Riegel Paper Corp. 21
Scandia Manufacturing Co. ..... inside front cover
Semet-Solvay Petrochemical Div., Allied Chemical & Dye Corp. 23
U. S. Bottlers Machinery Co. 32
Wrap-Ade Machine Co., Inc 34

CLASSIFIED ADVERTISING

Our classified advertising section is intended for use by those wishing to buy or sell used packaging equipment, to employ packaging personnel, seek such employment, offer or seek business opportunities. It is not available for general advertising. Terms: Cash with order. Rates: Up to 60 words, $10.00. If boxed, $20.00. Up to 120 words, $20.00. If boxed, $40.00. Up to 180 words, $30.00. If boxed, $60.00.

Circulation this issue in excess of 35,000

FOR SALE

For Sale — Packaging machine, Battle Creek Model BT30 and Bond M L Dual Filler. Fills, seals folding boxes, both bottom and top. Continuous flow principle. Quickly convertible. Wide range of boxes up to 10 inches in height, 30-40 per minute. Price new machine $15,120.00; this used one $5,000.00. Reply to W. J. Wittekind Company, 1041 Richmond Street, Cincinnati 3, Ohio.

What we think

Total quality control, an increasing shortage of technical personnel, better in-plant, down-the-line communications — packaging men at the technical and operating levels can expect to hear a lot more about these during the coming months. Interestingly enough, they relate very closely. They all have a bearing on what is happening to the gap between a company's gross and its net. Unfortunately, today's skyrocketing costs of operation have been hiking one's break-even point until it is perilously close to the gross figure.

Probably no one subject arouses more interest among packaging people than quality control. But whether they think of it as buyers of packaging materials or as sellers of packaged products, far too many of them regard it as a policing or inspectional function. The trouble is that there is now such a general stepping-up of quality levels that inspection costs are becoming almost prohibitive.

You'll hear more about "total quality control"

But out of the confusion a new concept is arising: Total quality control. In a nutshell, it gets away from quality control as an inspect-accept-or-reject idea, and sees quality control as something which starts with the design of a product or paper and ends when the product reaches its user. In other words, consciously you build quality into your product at the start instead of trying to police it in after making the product.

The same seems to be true of packaging materials. Only with such a concept can adequate quality be maintained without the accompanying burdens of extremely high inspection levels and the devastating effects of excessive rejections.

Don't underestimate manpower shortage

The increasing shortage of technically trained people throughout industry is something we shall have to live with for some time. According to latest studies, we shall need in just ten years 100,000 more scientists and engineers than our schools can produce at their present rates. Parenthetically, if 20 or 30 more of each 1,000 college graduates take their degrees in scientific and engineering subjects, the shortage may be met. But whether the trend is reversed and the situation corrected is immaterial at this moment. The point is that virtually all companies can expect to have fewer technically trained people available for scientific and engineering functions.

Taken together, the problems of total quality control and a growing lack of technically qualified manpower add up to one possible conclusion: We must attain better quality control with less skilled people. Considering the intricacies of quality control per se, this may seem impossible. It would appear that the subtleties of statistical quality control demand a high degree of technical training.

Turning away from quality control as an inspectional and statistical concept to think of it in terms of a positive program of quality building and defect prevention, one may question that the job can be done by those of less rather than more technical qualification.

Be sure your workers understand their jobs

We think the whole thing reduces to a matter of better communications. We know plants that are doing an outstanding job on quality control by making the most of the people working on the line. They have reduced quality control to basic essentials and have communicated these to the people who work on packaging lines so that these people *understand* them.

For example, a major attainment of one quality manager was convincing the girls on the line that the reporting of defective packages was no reflection on them. He found that some of them were doctoring their reports to show that packages going through were within the control limits. As soon as he convinced them that the company wanted to know just how the packages were coming off the lines, and that the girls were merely reporters in this respect, his program went ahead quite successfully.

It boils down to making sure that people know why they are doing what they do. It is a mistake not to make the most of the people on the packaging lines. At the same time, it is more of a mistake to try to capitalize on their work without making sure they understand the whole thing.

Bruce Hollingren

Editor

For service — for any problem, A-to-Z of labeling glass containers — call your WORLD Sales Engineer

Your **WORLD** Salesman is a graduate engineer, competent, and reliable in his recommendations. His advice is never slanted, or biased in favor of "specialized" machines, for his company is the world's largest manufacturer of bottle labeling machinery *of all types*. Trust your **WORLD** Salesman with any problem, from blueprints to bottlenecks. He is an up-to-the-minute expert with 56 years company experience behind him. He will gladly help solve your problems and save you money . . . *call on him!*

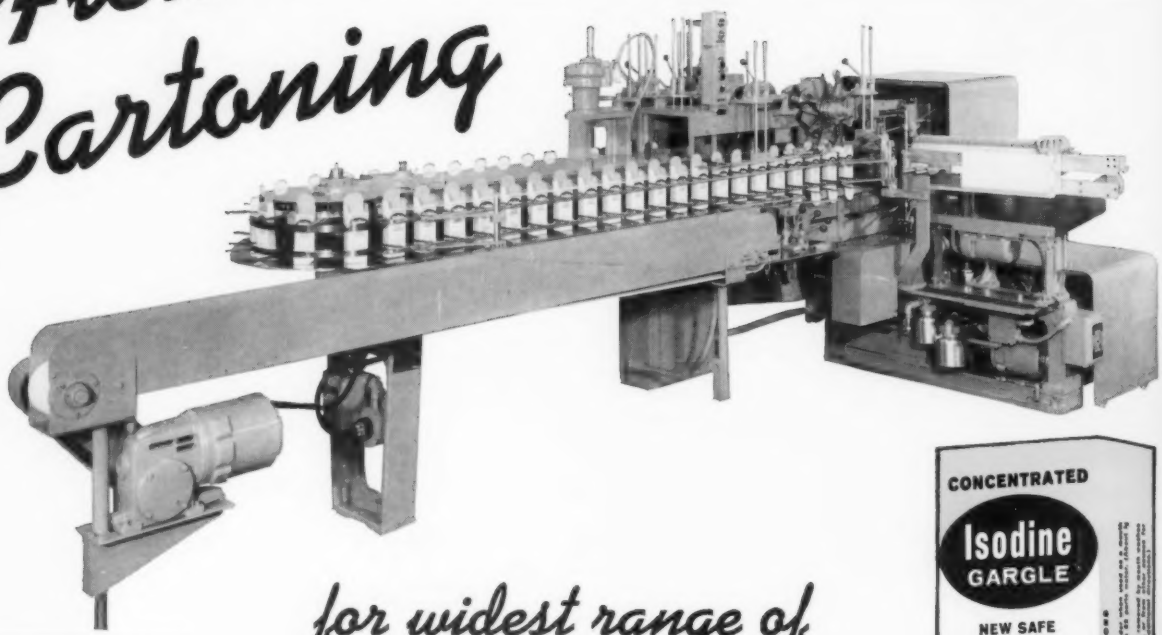
ECONOMIC MACHINERY COMPANY
60 Fremont Street, Worcester 3, Mass.
Division of Geo. J. Meyer Manufacturing Co.

LABELERS WORLD BANDERS

YOU'VE GOT THE BEST IN THE WORLD

For more information circle No. 238 on Reader Service Card

Flexible Cartoning



for widest range of EXACTING JOBS

Simple, fast adjustments on calibrated precision scales, for full range of carton sizes.

Available range of adjustments to carton sizes: ½" x ¾" x 1¾" to 7" x 7" x 12".

ISODINE GARGLE, promising entrant in highly competitive field, has no packaging strings or limitations to hamper its successful career. Market demands affecting the package can be met easily with the Jones CMV Cartoner. Carton styles may be altered, sizes added, experimental sizes and types of cartons tested; to any such changes the Jones CMV will be adjusted by in-plant workers using simple tools, and with minimum down-time (a few minutes only) in production.

The same built-in flexibility aids manufacturers of diversified product lines to maintain cartoning on smooth, full production, high speed and low cost program, short or long runs. (For continuous cartoning of fixed sizes the Jones CMC fully automatic cartoner is generally used.)

Jones CMV cartoners are promptly delivered and installed, as standard precision components are used. Ask for engineers' recommendations (without obligation) based on carton samples or specifications furnished by you.

Operation shown handles two loads per hand, 15 hand movements per minute; speed 60 cartons per minute.

R. A. JONES & CO., INC.

P. O. BOX 485, CINCINNATI, OHIO

Cartoners — Case Packers — Soap Presses